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Monitoring Times

A Publication of Grove Enterprises, Inc.

Reviews:

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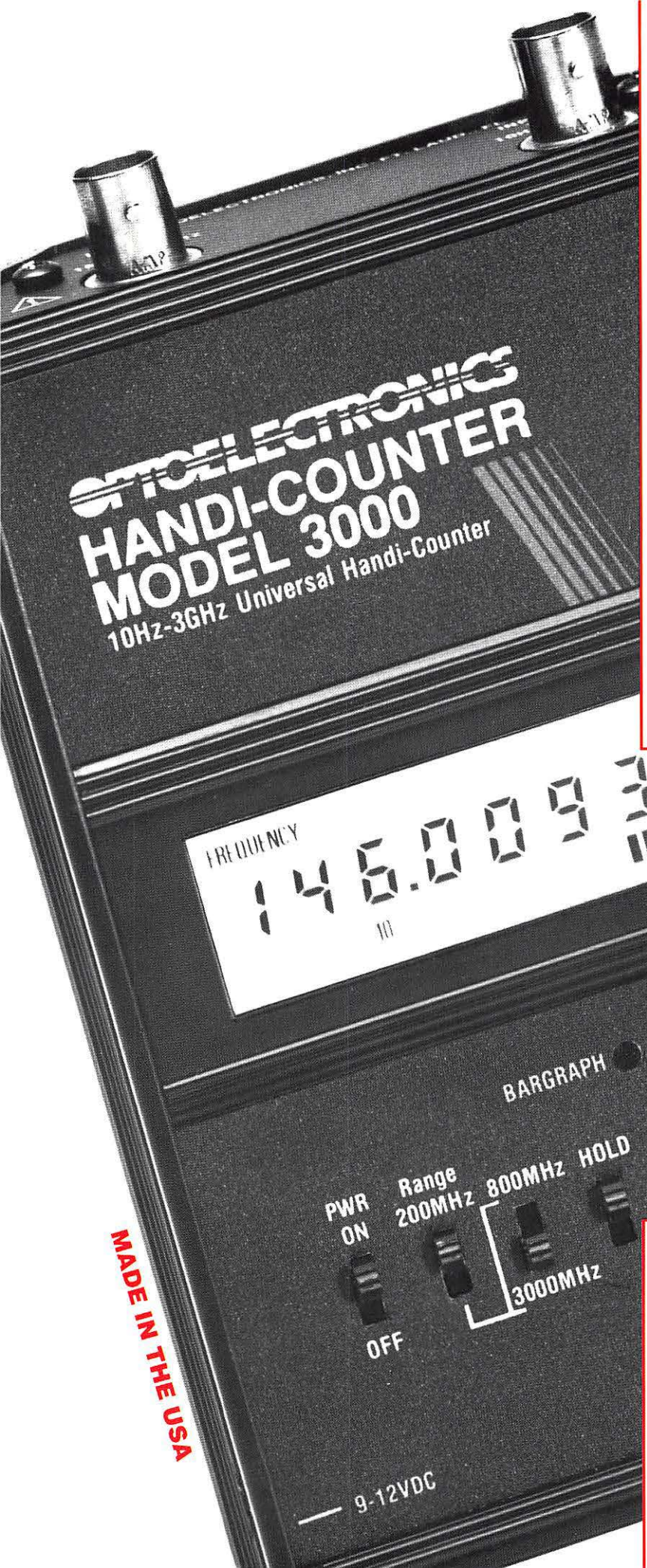

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October 1992

Monitoring Times

Earthquake Prediction

8

By Vince Migliore

Variations in radio waves and the earth's magnetic field are two of several promising approaches to earthquake prediction to which radio hobbyists may be able to make a contribution. In commemoration of the California earthquake of October 1989, *MT* takes a look at the current state of earthquake prediction technology, and also asks the question: Would you be prepared to monitor the situation if it happened today?

Radio Interoceanica

14

By Ken MacHarg

Five years ago, the small community of Santa Rosa, Ecuador, was devastated by a major earthquake, which also knocked out HCRI, the shortwave station that held the community together. Ken MacHarg of HCJB takes us along to visit this small station in the heart of Ecuador.

WWV: It's About Time!

18

By Wayne Heinen

Due to budget and staff restrictions, WWV, America's time standard station in Colorado, can no longer accommodate visitors. But by special arrangement, *MT* sneaked a peek, so that we could bring you this photo tour.

COVER: *Divisadero Street in the Marina district suffered some of the worst damage in 1989's October quake. "At street level, you could walk right into the second floor window of an apartment, knowing someone might be trapped below," says photographer Randall Lee, Fire Information Officer for the California Department of Forestry and Fire Protection.*

Monitoring the 900 MHz Cordless Phones 18

By Jack Sullivan

When a lightning strike knocked out both his cordless phones, Jack Sullivan turned misfortune into an opportunity. He purchased two of the new 900 MHz models—the Panasonic KX-T9000 and the VTech Tropez 900DX—and tested them against one another. Here are his findings.

The Day the Martians Landed 26

By Don Moore

You would have thought that anyone would have sense enough to avoid a repeat of "War of the Worlds" after what happened when Orson Welles' broadcast the radio drama on Halloween, 1938. Well, one station didn't—to their great regret.

And Much More ...

October's issue is packed with information on monitoring and on products. Besides the reviews listed on the cover, "Antenna Topics" takes a quick look at Elnec's antenna design software. But first, Clem Small asks the question, "What makes a good antenna, anyway?"

Shortwave and scanner listeners alike will want to read the "Scanner Equipment" column this month. If you thought the benefits of a spectrum display unit were beyond your means, you'll be very interested in this announcement and description of the new Grove Spectrum Display.

How do you interest a non-listener in your radio hobby?! The deflating "That's nice, dear," is something we've all encountered. To combat such apathetic responses try the ideas in this month's "Beginner's Corner." Or maybe you can catch their attention by the scanner activity to be found during hunting season, as described in the "Scanning Report."

There's something for everyone in this issue of *Monitoring Times*, so let's get to it!

DEPARTMENTS

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LETTERS

MT and the Mails

October marks the third, and probably the final, month of our experimental protective cover for *MT*, and I must say, the responses to it have been mixed! The yeas and nays are fairly evenly divided among the 540 responses received. The "Yes! Yes! Yes! Yes!" from Michigan is balanced by the "No, nyet, nein, never, negative, no way, no how!" from Virginia.

Two recurring comments were heard from both those who voted for a protective cover and those who voted against it: first, a concern for conservation, and second, the desire for better protection by a polybag.

We echo the desire not to be wasteful. (That's why Grove "used" the space for advertising!). We practice recycling both here at the office and in our homes. Yes, using recycled paper for the protective cover is certainly an option, but it should be pointed out that you also have an option--that of recycling not only the protective cover, but the entire issue (except perhaps the glossy cover).

A biodegradable polybag would provide the most complete protection for the magazine, we agree. The problem is, the polybag costs 10 cents per issue, or $1.20 per year—twice the cost of the heavy paper. Multiply that amount by the number of mailed subscriptions, and it adds up to more than *MT* can absorb.

It does seem clear, however, that the protective cover is not going to "cover" all instances of mistreatment. Take one reader in Pennsylvania, for example, who says, "My magazines are as much as a month late, very much dog-eared, and in a few cases articles have been neatly cut out!" Several others noted that their *MT*s appeared to have been "pre-read!"

Without a definitive response in favor of the protective cover, we will probably opt against it and continue to study other avenues. We are gratified by the number of responses from our readers, and take that as an indication that you appreciate being asked!

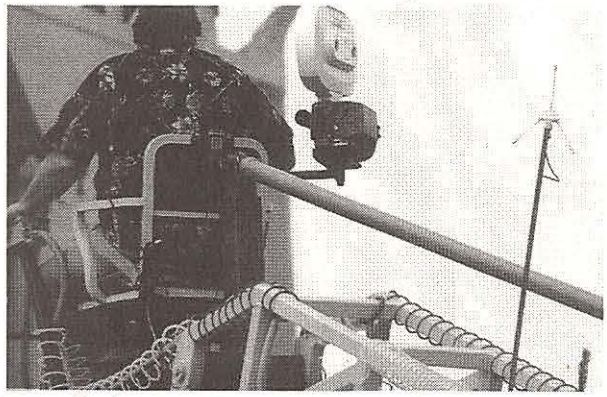
Since it appears that only a few magazines receive the worst treatment each month, we will gladly continue to replace those issues upon request. Although total cost to us of each "free" replacement is $2.00, replacing damaged issues still seems to be the most effective solution for everyone concerned.

Marching to a Different Drum

While I'm at it ... we occasionally get inquiries about the lateness of *MT*'s scheduled delivery. *Monitoring Times* is consistently mailed out ten days before the month on its cover. Most people receive their issue in three to seven days, just before the first of the month. We don't replace a "lost" issue until the 10th of the month.

Why don't we just mail the magazine 15-20 days before the date of issue so everyone can be assured of receiving it before the start of the month?

Well, we could... Perhaps the original reasoning had to do with our beginnings as a bi-monthly and the desire to be current as long as possible. But think about it; the date on the magazine is really irrelevant to the freshness of the information in its pages. That's determined by how much time passes between composition by the writers and the day you hold the magazine in your hands. We do our best to make sure our news is as timely as possible in a monthly publication; backing up the deadlines wouldn't make the information any more recent.



"What frequency goes with this antenna? An enquiring reader wants to know."

Monitoring in the World of Disney

BH of Massachusetts joined the camera-toting masses vacationing at Disney World, but underneath his light jacket he had tucked away his Bearcat 200XLT scanner, which he discreetly monitored with walkman style "earbuds."

Our anonymous hobbyist had already programmed into his scanner about 15 different 460 MHz repeater frequencies for the park which were audible from his hotel room. In the parking lot he found several more.

"Talk about staying ahead of people! The information on the frequencies was absolutely invaluable when it came to finding a good spot to sit/stand to watch the attractions."

However, BH says, "After searching every available band that my scanner could access, I came up with no clue as to what frequency(s) are used to transmit the soundtracks to the floats. Do any readers know the frequency(s) and transmitter location(s)? I would have figured VHF as the antennas on the floats at the Magic Kingdom appear to be quarter wave."

BH got to monitor some minor excitement from the fire department and security personnel when a fireworks shell landed on the roof of an MGM attraction. Better yet, he was forewarned to avoid "Thunder Mountain" because of a planned "malfunction"—preferential treatment for Jimmy and Rosalyn Carter. Don't you think BH felt smug when Carter's picture appeared in the Orlando paper the next morning?!

Bad Press for "Technocreeps"

Thanks to our stalwart readers, we have received clippings and reports of *Monitoring Times* making the news in at least seven newspapers around the country, including Alaska. But the press isn't generally complimentary.

As David Williams of Louisiana says, "I've been called 'Daddy' by my little boy, 'Darling,' by my wife and some unmentionables by my coworkers at Westinghouse. But now I'm referred to as a 'technocreep'! Get real! If somebody has something to say that does not need to be overheard, they need to get a secure means of communications."

David was responding to a quote from Norman Black of the Cellular Telecommunications Industry Association who said, "we are talking about a bunch of technocreeps who are eavesdropping and violating our privacy in the name of a hobby."

One Associated Press article which was widely circulated made the first mention I've seen in a long time of the House bill which would prohibit manufacture of cellular-capable receivers. Is this why Mr. Black upped the emotional content of his comments? Is the Senate vote finally coming up? So far the Senate has not included that legislation in their version of the FCC Appropriations Bill, but the CTIA knows the privacy issue is easily exploited.

What can you do? Write your senator and write a letter to the editor when you see such distortions in your newspaper. A couple of readers suggested *MT* should issue a reply to the newspapers. Thanks; and we do! But meanwhile, the ones whose opinions count most to the media are their local subscribers and the purchasing public. Help set the record straight and tell the media the good side of the radio hobby.

Inside Information

John Moran of Tempe, Arizona, enjoyed August's "Ringside at the Runway" article, and adds these experiences: "Every week I commute between Phoenix and Los Angeles. The people at Delta know that by using my scanner I can give them advance information on any anticipated inbound or outbound delays.

"At the Phoenix Airport, the roof of Terminal-3 (eight stories high) provides a nice location for airline monitoring or photography. T-3 and T-4 are right next to the tower so you can get great photos of the tower also.

"At Los Angeles International (LAX) there are several good viewing and monitoring locations. The Theme Room Restaurant in the center of the terminal complex provides a nice view of both the north and south complexes. Especially at night, you can see the planes seem to fall out of the sky as they turn on their landing lights and prepare for the approach.

"Imperial Highway runs along the airport's southern boundary with a panoramic view, or you can park for free at Imperial Terminal and get close-up views of aircraft as they taxi by.

"During the LA riots, the approach controllers at the LAX tracom facility had to try to keep planes approaching LAX away from the riot areas. Usually LAX uses runway 24 and 25. However, at night (midnight-7am) they have opposite direction traffic for noise abatement. During the riots, when it was reported that shots were fired at aircraft, the controllers quickly moved all traffic out over the ocean using the opposite direction scheme. This resulted in some delays as aircraft were told to circle until they could be worked into the pattern."

Brian Webb photographs a California National Guardsman replacing the battery in a transceiver while on guard at a mini-mall in Koreatown, Los Angeles.

The Quiet on the Western Front

While on the subject of the LA riots, the lack of communications on National Guard frequencies was noted by several monitors. Jeff Haverlah of Humble, Texas, came across a partial explanation in an article by National Guardsman Robert McGlashan, in *Reason* magazine. The article says, "The police radio was rarely silent, but our military radio was extremely quiet. Field units used the military channels to establish contact upon arriving at a new location or to report that something was going on. Calls over the military radio took the highest priority. If ... it was important enough to call us, it meant that trouble could erupt and someone could get hurt or killed."

This practice agrees with what Brian Webb of Los Angeles also monitored. "I heard a small amount of military communications. Much of what I heard appeared to be radio technicians setting up radio equipment and performing radio checks. After an hour or so, I didn't hear anything from the military."

However, while in Koreatown, Brian pursued the question with a National Guardsman named Hunter. "He said that their portable radios had a low transmitter power output. His group

Continued on page 97

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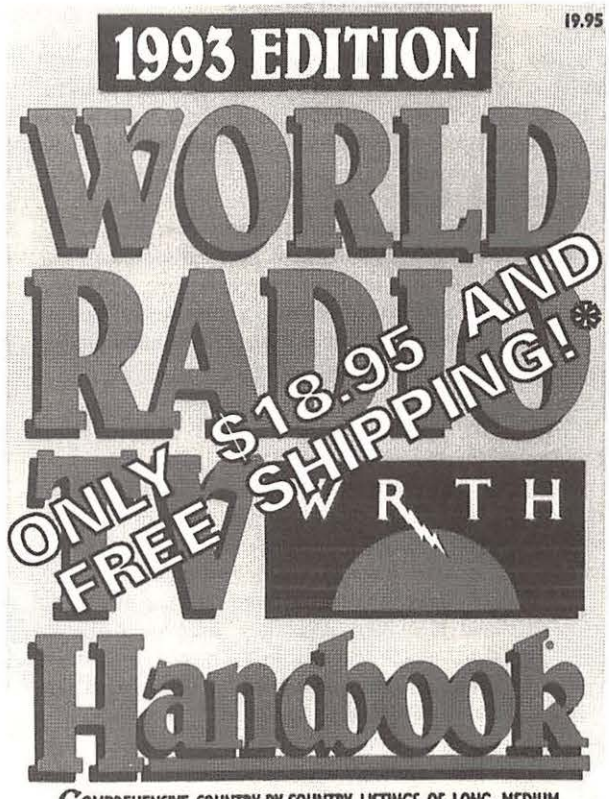

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COMMUNICATIONS

"Ungodly" Gays

The Lambda Amateur Radio club, a group of gay and lesbian radio operators that is currently suing the American Radio Relay League (ARRL) for the right to advertise in *QST*, has taken an unexpected hit from *73* magazine. Publisher Dr. Wayne Green has cancelled their classified ad in his magazine. Green also reportedly criticized the group saying that "Suers belong in the sewer."

He also added that "I've come to the conclusion that homosexuality is ungodly [and]... on a par with any other birth defect."

Lambda president Jim Kelly, KK3K, was outraged saying that "Our days of doing as we're told by bigots are over!" The gay radio group's ad still runs in *CQ* magazine.

"Ungodly" Women?

It's another positive step, say officials from the government of Afghanistan: female broadcasters have been banned from TV. The change came after demands by some radical Mojahedin elders. Until the complaints were received, women were allowed to present the news so long as a scarf covered their hair and neck.

Dianagate

After holding the story for two years, the London *Sun* finally revealed the existence of tapes which appear to contain conversations between Princess Diana and a man, possibly James Gilby, a marketing consultant for Lotus Cars.

The two radio hobbyists who taped the calls and then sold them to the *Sun* were taking quite a risk: Listening to a conversation transmitted by any post or public communications system is illegal by the Wireless and Telegraphy Act of 1949, and divulging it to a third party is likewise illegal (as it also is in the United States).

In the United Kingdom, you can only legally listen to broadcast radio stations, TV stations (for which you need a license), CB radio, and amateur radio. Listening to anything else (i.e., marine transmissions, air traffic communications, etc.) is illegal unless you are licensed to do so.

Even possessing a scanner having an unauthorized frequency programmed into memory can be enough to get a conviction against you, whether you were caught while listening or not, says English contributor Paul Greenwood. Greenwood found it rather astonishing that there appeared to be no plans to penalize the hobbyists (called "hams" in the English papers) who taped the conversations.

Bob Grove was called by the British media to confirm the technology involved in such intercepts—(the hobbyist who made the first tape used an ICOM R700 "spy radio")—and to inquire about similar activity in the U.S.

Flashback/Changes

Shortwave listeners in the late 1960s could easily hear the droning, anti-imperialistic rhetoric of the hard-line Radio Moscow. Spin the dial and they could listen to Vietnam's Hanoi Hanna attempting to demoralize U.S. troops in southeast Asia.

Boy, have things changed! A station broadcasting in Vietnamese and calling itself the "Voice of Freedom" has been using old Radio Moscow World Service transmitters. Funding for the station comes from private individuals in the United States.

All's Fair in Love and War...

A former Palm Beach condominium manager is facing wiretapping charges for allegedly trying to put a homemade tap on the building's telephone lines. According to the Palm Beach Post, investigators arrested 49 year old Philip Paul Hockman after they discovered that he wired a tape recorder to his own phone line so he could listen to conversations between his wife and his girlfriend's husband.

Hockman maintains that he didn't do anything wrong since it was his own phone line that he tapped and because he purchased all of the materials at a local Radio Shack.

However, when a Southern Bell investigator went to the condo, court records indicate that Hockman reportedly gave a condo employee $2,000 and instructions to destroy a box containing five cassette tapes and a handgun.

Hockman is free on $1,000 bond.

Roving Wiretaps Approved

A federal appeals court has given its approval for roving wiretaps, saying that they are a reasonable response to criminals who use several phones to avoid detection. The decision makes the Ninth U.S. Circuit Court of Appeals in San Francisco the highest level court to uphold the 1986 law that allowed the moving taps.

But according to Associated Press, it won't be the last. A lawyer in the case promises to appeal saying that the ruling gives the U.S. Constitution "another whack on the jaw."

Radio Recovery

"It might be a little boring, but we don't have to worry about advertisers or ratings," Army Sgt. Steve Malnar, told the *Orlando Sentinel*. Malnar is a military broadcast journalist who is helping to provide a steady stream of information to hurricane victims in Homestead, Florida. The make-shift 400-watt AM station, Radio Recovery, broadcasts over a 30-mile radius from a tent pitched in a parking lot.

Getting out relief information has been a major problem in a town without electrical power. In addition to providing the AM station, 12,000 inexpensive, battery-operated radios are being distributed by the Army so that the population can pick up the broadcasts.

A day's broadcast might include such news items as agency phone numbers, the location of a food drop, and encouragement for people to use the showers and toilets at the tent cities. Radio Recovery broadcasts in English, Spanish and Creole, and is reported to be adding a Guatemalan dialect.

The station broadcasts on 1610 kHz; if its 400 watts are boosted to 1,000 as planned, there is a chance you might hear it. If you do, reports may be sent to: SFC Steven Malnar, Radio Recovery, Federal Emergency Management Agency, Field Office 955, 36th and LeJeune, Bldg. 11, P.O. Box 4022, Room 3427, Miami, FL 33159-4022.

In a related story from the Associated Press, relief worker Herbert Engelman was declared clinically dead after being struck by lightning. Engelman, an amateur radio operator, Navy medic, and worker with the handicapped, was helping direct an Army helicopter loaded with food and supplies at the time he was struck.

Food, Folks and Fun

If you liked listening to your local fast food restaurant on your scanner, you're going to love listening to your local hospital.

The same technology that allows scanner listeners to hear such things as "I'll take a burger, small fries and a chocolate shake" may now allow them to hear "Mr. Miller is in cardiac arrest."

COMMUNICATIONS

Instead of using hospital intercoms, nurses can now wear headset/microphone combinations that will give them instant, hands-free access to the central desk and the assistance they need instead of having to find and fumble with an intercom.

The system is now being tested at Rush-Presbyterian-St. Luke's Medical Center in Chicago and the Ochsner Foundation hospital in New Orleans. Frequencies were not specified.

Ding-Dong. WJZZ Calling...

Bob Tilden hears the news 24-hours a day—through his electric door chime. The only way he can sleep is to turn down the volume on the chimes. It's hard to hear the door now but it doesn't matter. No one ever wants to come back.

Tilden is one of a number of Oak Park, Illinois, residents who are living in what the *Free Press* called "Radio Hell." Radio Hell is a location less than a mile from an 800 foot radio tower that carries four FM stations.

Eighteen of the residents are so fed up with the problem that they have filed suit against the owners of the tower and the FM stations. They are seeking $180,000 in damages plus a solution to the problem and a health study.

Nhoj Douglas, an audio consultant, says he's never seen interference like that found at Bob Tilden's apartment. He says that he measured strong radio signals on cold-water pipes on the basement floor. "These people are living in a very dense radio frequency field."

Down They Come

According to the *National Underwriter*, insurance companies are becoming increasingly concerned about vandalism against communications towers. In February, a tower owned by the Christian Broadcasting Company and located in Edgerton, Ohio, was felled. Two additional television towers, both within a 15 mile radius of the one in Edgerton, also dropped that same week.

Vandals also destroyed an AM tower in North Carolina and a cellular phone tower in Illinois. Damages ranged from $120,000 to $300,000 to potentially millions of dollars.

According to one underwriter, it's the owners of the towers that are under attack, not the equipment itself. In other instances, however, it appears as though environmental activists may have been involved.

"Towers are especially vulnerable to vandalism because they are usually erected in isolated locations," insurers agree.

Eighth Wonder

It won't be long before Poland will once again be able to lay claim to its place in history as home of the world's tallest structure—a radio tower. The mast for Polish Radio's longwave transmitter will reportedly be 646 meters tall and—at this point—will be constructed by a Polish firm. The original tower, located in Konstantynow, fell over last year.

The Dangers of Ham Radio

It's a tough job but somebody's got to do it. For 47 years, amateur radio operator Czeslaw Myslowski spent his life and his family's fortune trying to make contact with UFOs. Then it happened. On August 25th, police switchboards (in Poland) lit up with over 250 reports of a strange object in the sky. The object, described as looking something like the Grove SW-100, supposedly hovered over the radio operator's house for about 10 minutes, then zig-zagged into the sky and disappeared—along with Myslowski.

Police Captain Henryk Pazera stopped short of saying that the old man was abducted by space aliens. But he grudgingly acknowledged that the evidence does seem to point in that direction. "If you think I'm going to come right out and say it, you're crazy," said Captain Henryk.

The story of ham radio operator Czeslaw Myslowski came from a recent issue of the *Weekly World News*. We made up the part about the UFO looking like a Grove SW-100.

Thanks to: Dave Alpert, New York, New York; G. Keene Anderson, Orlando, FL; Don Benningfield, Garland, Texas; Jack Blum, Tri-Cities, Washington; Brian Cathcart, West Palm Beach, Florida; Ogal Crews, Alexandria, Virginia; J. J. Freeman, Norfolk, Virginia; Paul Greenwood, Berkshire, England; Matt Gribas, Grand Rapids, Michigan; Wayne Heinen, Aurora, Colorado; Russ Hill, Oak Park, Michigan; Thomas McKeon, Indianapolis, Indiana; Vince Migliore, Santa Clara, California; Ricardo Molinar, Ft. Lee, New Jersey; Jim Pogue, Memphis, TN; Doug Robertson, Oxnard, California; R. Rogers, Vancouver, British Columbia; William Sellers, Capshaw, Alabama; Joe Weidhaas, St. Louis, Missouri; the BBC Monitoring Service, the U.S. Federal Communications Commission, and the *W5YI Report*. Communications is written and edited by Larry Miller from material supplied by readers like you. Thanks.

Earthquake Prediction

Is Science Narrowing the Gap?

Story by Vince T. Migliore
Photos of October 1989 earthquake by Randall Lee

A magnitude seven earthquake releases about the same amount of energy as a one megaton nuclear bomb. Such powerful forces don't just appear magically, but rather accumulate over a long period of time by the movement of Earth's tectonic plates. The build-up and triggering of this energy, it would seem, should be capable of detection by scientific instruments. Seismologists have been frustrated, however, in their attempts to find a dependable short-term predictor of earthquakes, relying instead on 30-year probabilities based in large part on past history.

Now, some exciting new developments hold out the promise of reliable forecasting of large earthquakes anywhere from three hours to three weeks prior to an event. Equally interesting is the fact that these new techniques can be duplicated by back-yard geophysical monitoring devices easily built by electronic experimenters.

The modern science of earthquake prediction started soon after the Loma Prieta earthquake in California in October 1989, when a team headed by Anthony Fraser-Smith (STAR Lab, Stanford, CA) released a report of large increases of noise and transients in the ultra-low frequency (ULF) range of the magnetic spectrum (DC to 3 Hz). In fact, the Fraser-Smith study found a distinct pattern of increased noise from .05 to 10 Hz. "The system recorded anomalous magnetic activity beginning over a month before the quake, and continuing until the moment of the quake."

The Fraser-Smith study was momentous not so much for its documentation of magnetic events associated with earthquakes, but because, finally, the goddess of Western Science was able to capture signals just seven kilometers from the epicenter, thereby confirming the not-so-revered research coming out of Russia and Japan.

Earthquake Prediction Conference

Earthquake prediction goes back to at least ancient Greece when Aristotle and Pliny the Elder warned of coming quakes through such signs as birds not flying and tainted wells. The Chinese have a long folk history, and some recent successes, in earthquake prediction based on animal behavior. This is well documented in the classic, *When the Snakes Awake*, by Helmut Tributsch (MIT Press, 1982).

As scientific inquiry advanced through the electronics age, researchers were afforded powerful new tools to examine some of the legends and anecdotes regarding earthquakes. As mentioned, Russian, Japanese and some European researchers were already looking at the electromagnetic spectrum for quake precursors, but the subject was not given the nod of approval by U.S. investigators.

After Loma Prieta and the report by the Stanford team, the momentum was on the side of the unorthodox researchers. In June of this year, the United States Geological Survey (USGS — the agency responsible for earthquake prediction), quietly called a conference on this emerging new field of seismology. Begrudgingly entitled "Electromagnetic Precursors to Earthquakes: Fact or Fiction?" the workshop was by-invitation-only to about 40 scientists and was organized by Dr. Stephen Park of the University of California at Riverside.

A delegate from the National Science Foundation (NSF), cosponsor of the conference, was

Deceptively upright buildings were often discovered to have collapsed one level, like an accordian. Military police from the Presidio and Ft. Ord prevented looting and sight-seeing. One MP, a Sgt. Buford Jackson, carried a PRO34 scanner and often heard of trouble spots long before hearing over the military handie talkie.

Engineers and fire marshalls inspected and condemned buildings judged in danger of collapse.

at the meeting, raising the hope that the NSF or the USGS would help fund further research in this field. The innovative researchers, however, rated the attitude of the funding decision-makers as anywhere from "hostile" to "playing devil's advocate" to the ideas presented. On the other hand, the continuing activity in southern California may tip the scales toward sponsoring experiments aimed at electromagnetic monitoring.

"They want statistics that show a high correlation—a 90% reliability measure," complains Elizabeth Rauscher, one of the participants, "but the weather bureau is lucky if they reach 50% reliability, and look at the funding they get! But, it they want statistics, I'll give it to them. I think I can prove my point."

During this conference, ironically, one of the researchers successfully predicted the 7.5 shaker that was to occur in Yucca Valley on June 28, 1992, just a few miles from the Lake Arrowhead conference site. Jack Dea, of the Naval Command, Control and Ocean Surveillance Center in San Diego noted a number of ULF transients prior to that quake. Dea uses a method developed over a two-decade period by Elizabeth Rauscher and William Van Bise of Electromagnetic Signal Labs, Reno, Nevada.

The Rauscher-Bise method looks at transients in the .01 to 20 Hz range, with particular emphasis on the 3 to 4 Hz region. They claim detecting the signals is a science, but that interpretation is a real art form. Officially, they do not give quake predictions but privately they did foretell a 4.7 Yucca Valley aftershock in mid-August 1992, and they let slip that another major event may be on the horizon for California if there is a large solar flare.

Other attendees explored different areas. A team of Greek scientists reported finding slow changes in ground potential prior to a quake—by simply measuring the voltage of a longwire antenna at ground level. This "VAN method" is described in a book just out by Haroun Tazieff, called *Earthquake Prediction,* McGraw-Hill, 1992. Friedemann Freund of NASA Ames Research Center spoke about measuring certain charged particles prior to quakes.

Several Japanese investigators looking at higher frequencies in the electromagnetic spectrum were also invited to the conference. Their efforts focused on radio emissions around 8kHz. Sausalito scientist Joe Tate, also an attendee, claims radio frequency transients have been detected prior to quakes across a broad spectrum from about 10 kHz up to 100 kHz. This brings to mind the many and persistent reports from ham radio operators of increased noise and static all the way up to the high frequency bands prior to past seismic events.

Seismic Triggers

The June quake prediction conference had the effect of at least opening the door to the tracking of magnetic and electromagnetic anomalies as earthquake precursors. These non-traditional indicators, though, are just the tip of the iceberg. Off the record, several workshop participants (and many who were not invited) relate stories and suspicions of even more broad-ranging interconnections with other disciplines. These other processes may also provide clues to forces that trigger earthquakes. Briefly, since they are less well studied and more controversial, the other areas of interest in quake prediction are as follows:

1. **Magnetism.** The Earth's geo-magnetic field extends far out into space and is influenced by the solar wind. Oscillations in this field have been associated with quakes. For a report on a Russian monitoring system see "Stalking LF Variations in Earth's Magnetic Field," by William Worthington, *Evaluation Engineering*, January 1991.
2. **Atmospherics.** Radio wave propagation may be linked to earthquakes. The ionospheric layer responsible for radio wave skips is influenced by solar flares and the diurnal rotation. There are times when radio propagation experiences a sudden drop or sudden enhancement of signals that may be correlated to earthquakes. Several amateur radio operators are using worldwide beacons to measure changes in propagation. The role of solar flares in earthquakes was pioneered by Patrick Huyghe, "Earthquakes: the Solar Connection," *Science Digest,* October 1982.
3. **Gravity.** Studies of solar, lunar and planetary tidal forces acting on the earth have been linked to quakes. Quake prognosticator Jim

RESOURCES

• **Geo-Monitor newsletter.** Contents include monthly earthquake listings and maps, tracking lost pet ads, solar activity, news events and literature review. Each month includes a simple, low-cost home-built device that may be useful in earthquake prediction. Subscription price is $24.00 for 12 issues (USA) and $30.00 for overseas airmail. Write ***Geo-Monitor,*** #400, 65 Washington Street, Santa Clara, CA **95050.** Phone: (408) 749-6770. Back issues are $2.00 each. Sample projects include the following: Pendulum seismometer - Vol.2, #8, August'92 Magnetic transient detector Vol.2, #5, May '92 Radio propagation studies Vol.2, #4, April '92.

• **Public Seismic Network.** This group was founded on the idea of linking backyard seismographs to a USGS computer network. It has evolved into a wellspring of information for amateur scientists and professionals alike. Lots of fantastic share-ware and interesting dialogs. Sys Op Steve Hammond: voice (408) 365-9830; BBS Pasadena (818) 797-0536; BBS Menlo Park (415) 327-1517; BBS San Jose (408) 226-0675. All are in California, using 2400 baud, 8-none-1.

• **The Southern California Network Bulletin. A** cooperative effort between the USGS and the California Institute of Technology. Provides access to USGS seismic telemetry and computer database. Write for Open-File report 92-335, Seismological Lab, California Institute of Technology, Pasadena, CA 91125.

• **Seismic Precursor Net.** The literature they send out contains a thorough description of their activities, addresses for further information, schematics and plans for seismic sensing devices, and photocopies of related magazine articles. Also available are plans for quake detectors and decoding transmissions from USGS seismometers. Send $10 to S.P.N., Keith Higgins, P.O. Box 306, Lakewood, CA 90714-0306.

Monitoring the Seismic Radio Network

The US Geological Survey (USGS) in conjunction with a number of state universities maintains an elaborate network of seismic detectors across the country. These are remotely monitored via VHF-FM telemetry.

To escape interference, frequency assignments are often on splinter channels (162.596875, 166.421875 MHz, etc.) or in less densely populated portions of the spectrum (217.960, 217.545 MHz, etc.).

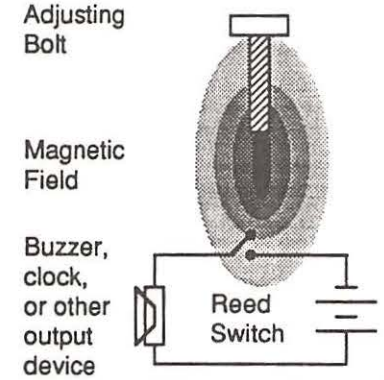
Such channels are easily identified by their continuous complex tone. Not a pure pitch like mobile telephone on-hook tones, seismic detectors typically emit a combination of three tones which indicate east/west, north/south and up/down movements of the earth's crust.

Technically-inclined experimenters who would like a packet of information and schematic diagrams of demodulators for these seismic transmissions may send $5 to Monitoring Times Reprints, PO Box 98, Brasstown, NC 28902.

We also recommend the Seismic Precursor Net listed above.

Figure 1.
Operation of the Reed Switch Magnetic Disturbance Detector.

The steel bolt brings the magnetic field from a permanent magnet into the vicinity of the Reed switch. The bolt is adjusted up to the threshold of tripping the switch. A disturbance in the Earth's geomagnetic field triggers the switch, closing the circuit to an output device, such as a buzzer. Reset circuit not shown.



Circuit by Ed Stork, Denver, PA. Design and construction details are available in Vol.2, No.5, May 1992 of Geo-Monitor ($2.00), Suite 400 65 Washington Street Santa Clara, CA 95050

Berkland, of Santa Clara County, California, uses high tides and the influence of the moon as part of his formula to predict quake "windows."

4. **Geophysical.** A wide variety of physical measurements may be helpful in predicting quakes. These include well water levels and temperature, release of gases and chemicals, ground resistivity, and weather patterns. Most such measures are accepted as valid by seismologists, and instruments to record these changes are in place in Parkfield, California, where the USGS expects a quake soon.

5. **Psychics and Sensitives.** The recent discovery of magnetite particles in the human brain follows similar findings in birds and mammals, and may lend some credence to human "psychic" predictions. Animal and marine behavior is also credited with quake forecasting by some.

Amateur Scientists

Earthquakes are relatively rare events, so monitoring of natural geophysical events to determine which ones are valuable in quake prediction can be a frustrating and time consuming occupation. Meanwhile, open-minded scientists generally don't have the resources nor the blessing of the bureaucracy to investigate some of the more controversial theories. This is a situation begging for the involvement of amateur scientists. There are quite a few simple-to-build experiments that can make profound contributions to quake prediction, the stepchild of the establishment.

To mention just a few: monitoring of radio beacons for sudden changes in propagation; tracking solar flares and lost pet ads; using a ULF converter to sample noise in the 10 to 100 kHz region and feeding the output to a strip chart recorder; and detecting and logging oscillations in the Earth's magnetic field.

Such projects gain value exponentially when they are conducted simultaneously with other tinkerers. To this end, I have been trying to create a forum for amateur experiments related to earthquakes. This forum takes the form of the *Geo-Monitor* newsletter (see sidebar). If you are terminally curious, would like to share ideas, or participate in some novel experiments, please send $2.00 for a sample issue.

One of the devices we use is a Reed switch magnetic field disturbance detector (Figure 1). For about $40 this simple detector gives the same results as a professional magnetic receiver and data acquisition system—namely an alarm when there is a wobble in the Earth's magnetic field. The alarm went off three times one morning at exactly the same time as the alarm of another researcher eight miles away. Another time it sounded when there were two small earthquakes (2.0 and 2.7) in Hollister, California, about 40 miles away. This doesn't mean the invention is a foolproof prediction instrument, but it does show that simple instruments can measure geophysical events that may be related to earthquakes, and that more research is needed.

Amateur radio operators and science experimenters have made tremendous contributions to the body of human knowledge. We may be on the threshold of momentous discoveries in the life-saving ability to predict earthquakes. We have a great opportunity not only to learn about, but to participate in an exciting new science. MT

Vince T. Migliore is a technical writer and researcher. He is editor of the Geo-Monitor newsletter, which is dedicated to earthquake prediction, amateur geophysical monitoring and earth mysteries.

Randall Lee is Fire Information Officer for the California Department of Forestry.

Being Prepared: Equipment

By Barnaby J. O'Leary

It's Tuesday, October 17, 1989, 5:03 pm at Candlestick Park, and I'm working the World Series as a systems technician in the Pacific Bell Broadcast Services Group (video and audio transmission). In just 60 seconds, my life and the lives of 58,000 others at the 'Stick, not to mention the lives of many other northern Californians, will never be the same.

The clock inches toward 5:04 pm. As the players are being introduced on the field, a strange thing happens. There appears to be applause at an inappropriate time. It's not applause. Just then, the floor begins to vibrate and the whole stadium jumps and sways for the longest 15 seconds of my 51 years. It's 5:04 pm and terra firma has turned to jello. The San Andreas Fault has just fractured!

Electric power came and went, then went for good. My sole source of radio information was a Sony FM Walkman. I tuned from 88 to 108 MHz and found virtually nothing. Little by little, stations with emergency generators came back on air, but much to my amazement, most had automated programming and were of no help. I have never felt so helpless! Never again will I be without a proper emergency communication package.

Here are the contents of the package I've carried ever since:

- One Bearcat BC-200XLT Scanner with Metro West Battery Pack
- Three standard BP-200 battery packs
- One Sony ICF PRO-80 handheld 150 kc to 108 MHz LW, MW, SW, FM
- Three BP23 Nicad packs
- One Alkaline pack
- Various adaptors
- Two 4-packs AA cells
- One AM/FM Walkman
- One 50-ft roll antenna wire

All this is contained in a small camera bag by Tamrac, 9"W x 7"H x 7"D. The front pocket contains an AIWA AM/FM Walkman, and the top lid pocket contains frequency data sheets and a calculator (which if it were a data organizer, could also contain frequencies and phone numers). A neat package.

The Acid Test

In March of 1992, after returning from a chat with a neighbor, I entered my home to find I had no AC power. It would be a long time coming. My ICOM-R71A and Realistic* PRO-2005 had been done in.

It's at times like this that the creative juices start to flow. My antenna farm was still intact. The R71A has two shortwave trap antennas at right angles plus a sloping 66 ft. Windom antenna running diagonal to the other two. These three feed an MFJ-1704 antenna switch, the output of which feeds the R71A.

I simply removed the feed to the R71A and with UHF-TNC adaptors, attached my Sony ICF PRO-80. Never has so small a radio been mated with such an antenna farm! Conclusion: The Sony PRO-80 is one fine mini-might. Later, I heard clearly the South Pacific, Australia, New Zealand, etc.

Next, I needed to replace the PRO-2005. It, too, has an antenna farm, consisting of one Diamond D-130J discone plus one Archer multi-band vertical antenna with ground plane. Both feed an MFJ CS 1X2 coaxial switch, the output of which feeds the 2005. I simply removed the coax feeding the PRO-2005 and attached it to the Bearcat 200XLT. Although 55 miles north of San Francisco, this combination produced a Bearcat 200XLT with very sensitive ears!

Back to Shortwave

While rummaging around for flashlights and batteries, I came across my old Sony 2001 under much dust. Had I removed the batteries before storage? Fortunately, I had. I had also accumulated over the past year, on sale, a variety of batteries for my lair. In popped three D-cells and old 2001 came to life. With a vertical antenna of just 46 inches, I was pleasantly surprised by its sensitivity, although at times selectivity was a bit loose.

Feeling totally in control of my situation, I kicked back with some Armenian finger food

(lavosch) and a glass of Chardonnay (this is California).

The following morning after breakfast, I checked all the radios. All but one worked—my 2001. I exercised the battery normal jack, no luck. Next I removed the batteries and measured their voltages. The first two were 1.45 volts, but the last was near zero. Then I felt the ooze of a leaking leakproof battery. This battery was replaced after cleaning the battery case. The lesson to be learned here is keep a ready supply of batteries, but rotate the supply so as to have a fresh supply on hand.

Afterthoughts

I won't have a gas generator because of fuel shortage problems. However, if I had a 12 volt battery under float charge, my PRO-2005 could be powered directly and so could my R71A with an optional card.

In the end, I am quite pleased with the performance of my magic camera bag. It is never out of my sight.

KNSD-TV Channel 39 San Diego, Ku band uplink truck can broadcast live from anywhere the truck can go. Communications also include cellular phones, business band UHF radios and numerous scanners.

Being Prepared: Frequencies

By Todd D. Dokey

Last spring's earthquake in Humboldt County, California, may be old news, but it's not old to those who are still recovering from the devastation. Such natural disasters always beg the question: What could I do to be better prepared and to help those around me?

During the Oakland Hills fire last fall, I was glad to have been prepared to cover the emergency. I looked into my computer files and pulled up all the relevant frequencies (more than I could really handle) and was able to listen to events as they happened.

This kind of preparation had always felt adequate until the Humboldt earthquake, after which I decided that listening was not enough. It reminded me of the last great San Francisco earthquake. In 1989 I had good connections through a long distance phone company and spent that first night in three-way calls to San Francisco connecting friends with worried family members. For some reason the company I worked for was able to get through in that first night.

This time I felt somehow unable to help. Not only did I not know anyone in Humboldt—I could not communicate what I heard from OES (Office of Emergency Services) or the Red Cross. I found myself becoming angry with the news agencies for not taking the small amount of time it would have taken to put together a standby network among affiliate stations in order to handle emergencies. No one seemed to have the basic information handling skills that I had at my disposal for monitoring.

Is this a sign that I am getting older?--that I consider these skills to be simple and obvious, when they really may not be to others? This realization is forcing me to change what I do with respect to monitoring. I decided it is time to become involved in amateur radio. I have been around ham radio for more years than I care to admit, but I never took the time to get the ham license, even though I have an aging First Class license.

It bears repeating that we must prepare for the unexpected, even if our only goal is to remain informed. So with that, I will dig into my databanks and come up with frequencies relevant to the task in preparation for "the next time."

Humboldt County Area

SHERIFF	FIRE	EMS	POLICE	CDF
154.740	46.060	463.000	154.950	159.270
154.920	46.220	463.100	154.920	159.405
155.070	154.430	463.125	156.030	151.385
155.850	153.950	463.150	155.070	151.250
155.475	158.865	463.175	155.250	151.145
45.960	154.010			151.310
453.000	33.700			
155.700				

RED CROSS	CHP	STATE WIDE MINES/GEOLOGY
47.660	42.240	Emerg. Msgs. Seismic monitoring
47.420	42.540	
155.280	159.300	217.500
155.340	151.355	218.000
155.385		

CALIFORNIA OES CESRS D&C Statewide	CALCORD	SECURE (Use)	FIRE
154.980	156.075	7,480	154.160
153.755		7,802	154.220
		5,140	33.980
		2,419	
		2,422	
		2,812	
		2,804	
		2,326	
		5,195	
		7,805	

SECURE = State Emergency Capability Using Radio Effectively.

Getting Involved

It was the annual Field Day for amateur radio clubs all over the United States and Canada when another earthquake struck Southern California. Bob Fraser of Cohasset, Massachusetts, sent in a clipping from the *Patriot Ledger* by reporter Shirley Leonard.

"Operators test their ability to make contact with other amateur radio operators during emergencies such as hurricanes and earthquakes. The schedule called for the drill to end at noon Sunday. But in Southern California, the test ended when the ground began to shake early Sunday morning," she said.

"The chatter from radio operators in the area went dead almost immediately. Abandoning the drill, they began passing along emergency information."

"They went from practice to reality real fast," said Rick Turner, a member of the Whitman Amateur Radio Club.

"It's typical of California," Fred Roog of Brockton said. "They go for special effects. They went all the way."

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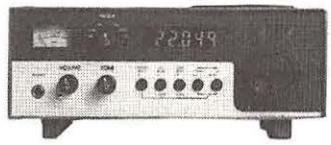

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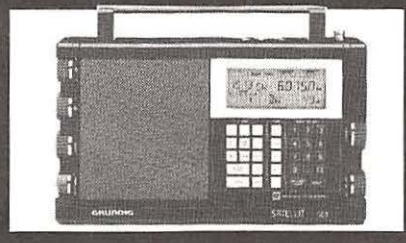

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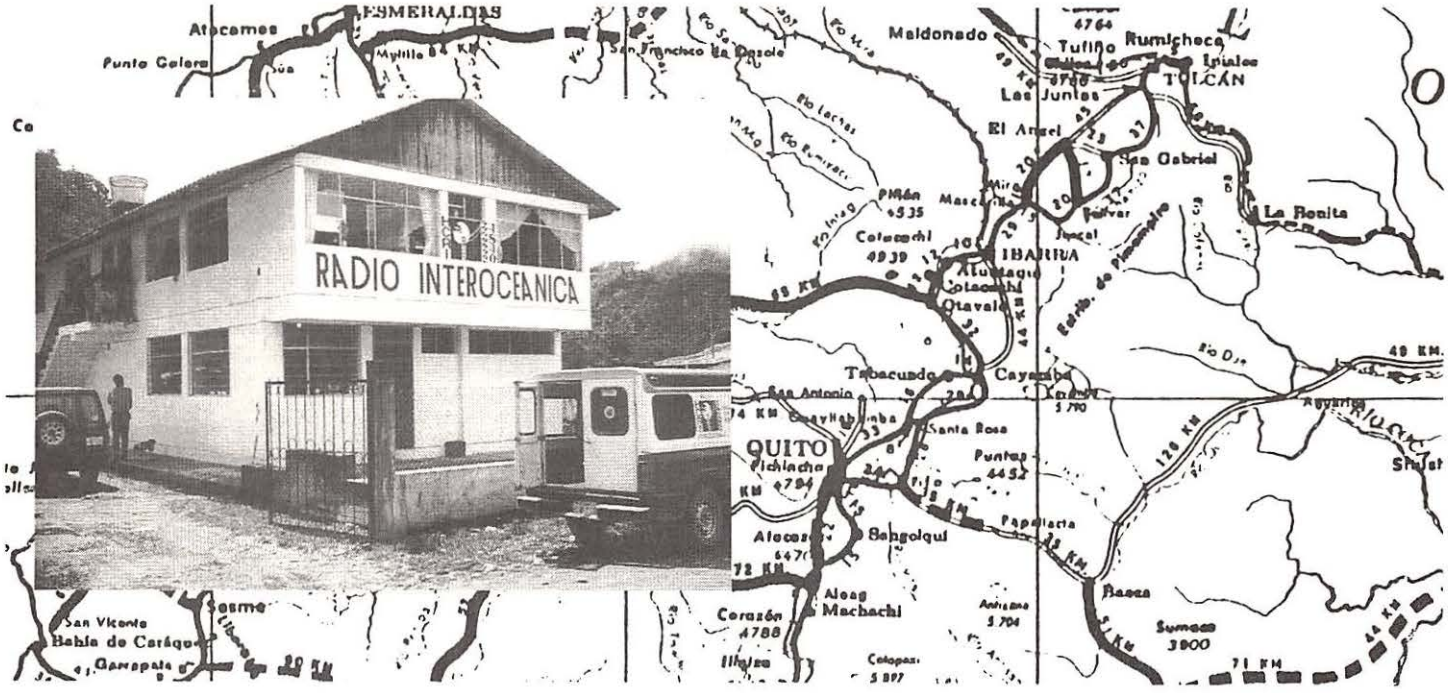


Radio Interoceanica

Solid Friendships from a Shaky Past

Story and photos by Kenneth D. MacHarg

In the heart of Ecuador, where the Andes mountains meet the jungle, there is a small radio station with affectionate ties to Canada's Ontario DX Association.

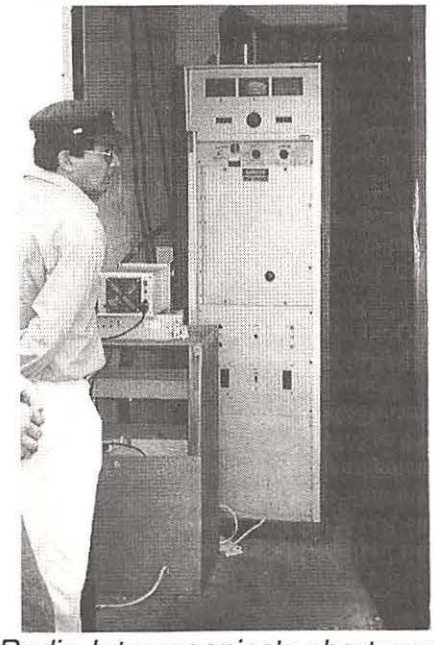
In 1987, a terrible earthquake struck the region around Santa Rosa, killing up to 4,000 people, destroying almost all homes in the area, knocking out the trans-Ecuadorian pipeline costing the country billions of dollars in international trade, and turning radio station HCRI—Radio Interoceanica—into a pile of rubble.

Reports over HCJB's DX Partyline shared the plight of these hard working people with the world and brought concerned response from compassionate people in many countries.

Among those with an interest were the members of the Ontario DX Association (ODXA) who responded with a generous contribution to help rebuild the area's only radio facility.

To drive out of the mountains and into the gently rolling valley where Radio Interoceanica is today, one would hardly know that such a disaster had struck only five years ago. Other than scars on the steep mountainsides where landslides occurred following the "terremoto," most reconstruction is finished. The oil pipeline snakes through the lush green valleys between majestic mountains and along rushing mountain rivers to the small settlement of Santa Rosa.

In the middle of the pueblo stands the attractive new building housing this station which ties the community together. Congenial manager, Byron Medina, is proud of the new facility which he says is the only voice available on local bands to the thousands of people in this remote part of the Napo province.



Radio Interoceanica's shortwave transmitter is a rebuilt RCA medium wave transmitter with 1,000 watts.

The station is owned by the Swedish Covenant church and has received extensive funding from the Swedish government which views its educational broadcasts as an educational and developmental project. (Church-state rules evidently don't apply to Swedish government expenditures as they do to U.S. government funds. Government funds from Sweden were also used to help build HCJB's new hospital at Shell, Ecuador).

Today, Radio Interoceanica emphasizes health concerns, education, science, agriculture and other developmental topics throughout its broadcast day. Señor Medina says that, as the only local station, Radio Interoceanica places news at the top of its priority list, developing newscasts throughout the day from items in one of Quito's daily newspapers, and using HCJB's Spanish newscasts as another source. The station also carries soccer and other sporting events from HCJB which it receives via a shortwave receiver in its studios.

Christian broadcasts are also important to this religious station. Each Sunday, a full worship service in the Indian language Quechua is broadcast especially for those living in remote mountain valleys where no churches exist. Byron Medina says that when Radio Interoceanica removed those Sunday morning services from the shortwave schedule a year ago, the station was flooded with letters from listeners asking that they be

All commercials and spots are on reel-to-reel tape. Here the operator cues one such message in the main control.

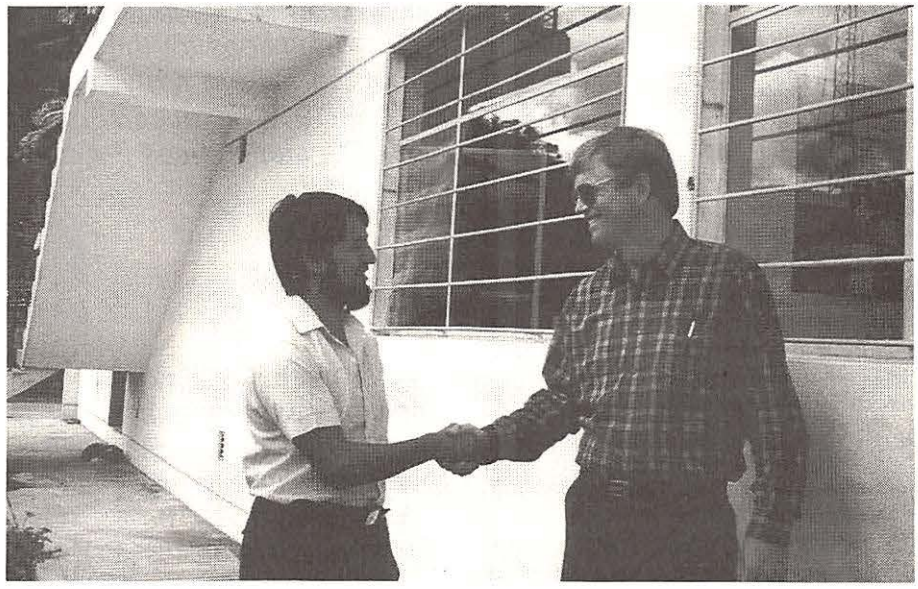
reinstated. He mentioned one entire small town without a church or pastor who gather together each Sunday morning to worship via radio.

Daily Quechua broadcasts are offered from 6:15-7:00 am local time, with the remainder of the day given to Spanish. Indian dialect hours are expanded on Sunday.

The attractive studio building (which ODXA funds helped to reconstruct) houses two complete studios, either of which can be used as the master control. Between the two control rooms a larger studio can be used for musical presentations or group discussions. The station does not use cart machines so common in North American stations, but each "spot" is on reel to reel tape which must be manually cued for every use. Manager Medina and his family live in a second floor apartment in the building. Other offices of the mission are located in an adjacent building.

Currently, Radio Interoceanica transmits on shortwave on 4940 kHz from 1100-1500 UTC and again from 2000-0200 UTC. Their FM frequency (96.3) is utilized from 1100-0200 UTC, with the shortwave transmitter simulcasting the FM programming. On Sunday, the shortwave transmitter remains on all day.

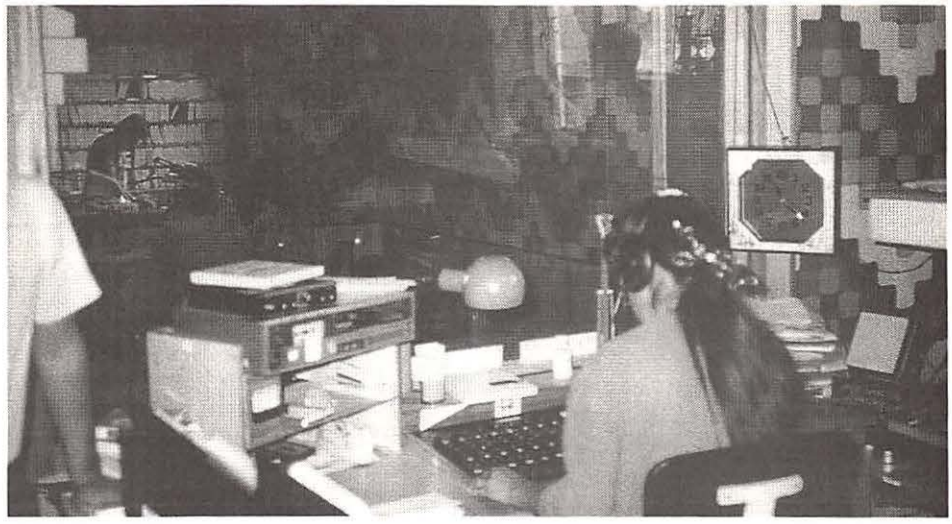
Prior to 1987, the station also broadcast on mediumwave. However, according to missionary engineer Olaf Hegmuir, local reception of AM was difficult, if not impossible, because the surrounding mountains blocked the signal. So Olaf took the old 1,000 watt mediumwave RCA transmitter and rebuilt it for shortwave. He says



Outside of their new studios in Santa Rosa, Ecuador, Radio Interoceanica general manager Byron Medina (left) greets John Beck, International Program Director of HCJB.

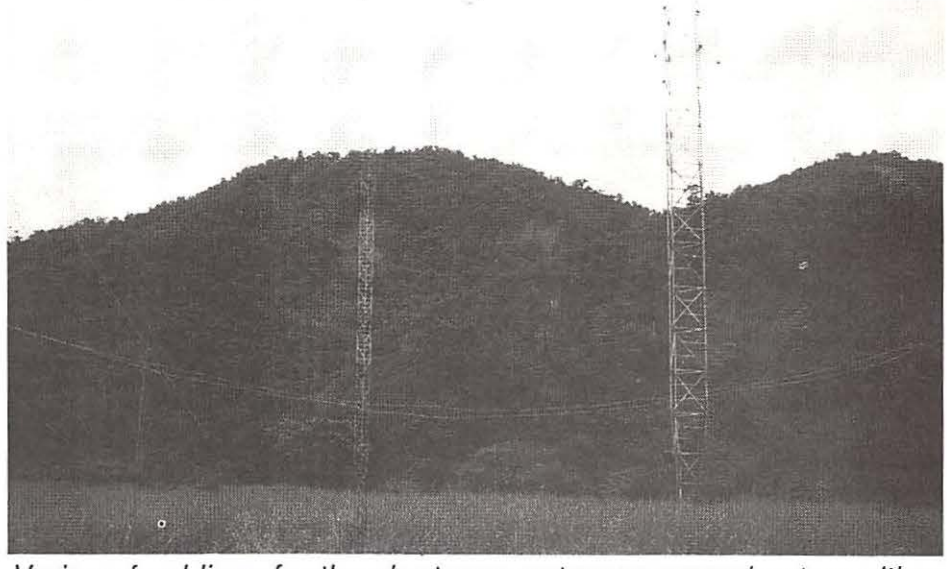
he is pleased with its performance. Besides reaching the local population tucked away in remote mountain or jungle villages, the station also reaches an international audience as attested by letters received from listeners in Costa Rica, Japan, Colombia, Venezuela, the United States and parts of Europe.

A transmitter site two blocks from the studio building was virtually undamaged by the 1987 earthquake. The two AM towers still stand, one being used for the FM antenna. For shortwave, Olaf has built two lazy H simple dipoles on either side of the AM array to send the signal straight up, allowing it to cover the region like an umbrella.



Looking from the main control room through the center studio on into the second control and tape library.

RADIO 9640 INTEROCEANICA

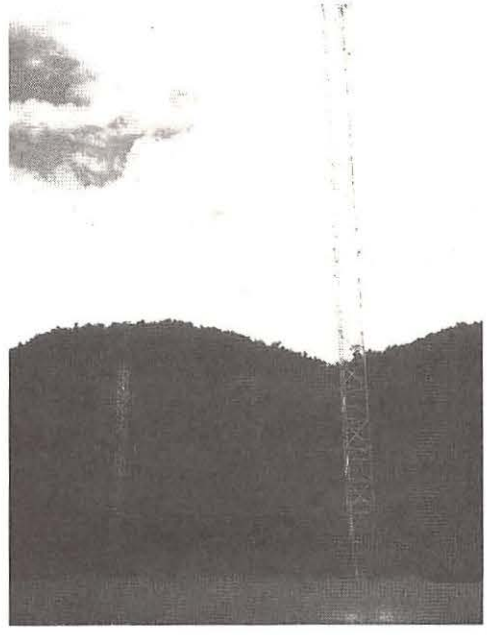


Various feed lines for the shortwave antennas spread out on either side of the old AM array. AM was taken off the air after the earthquake in 1987 because surrounding mountains blocked the signal. Today the station uses FM and shortwave.

Byron Medina speaks proudly of the 18 hours per day of programming which his small staff of four produces. He recognizes that Radio Interoceanica is a vital link to reach the people of this rugged province with health information, educational information, and the latest news. He also speaks positively about the response of area residents to the Christian message carried by the station's transmitters.

Radio Interoceanica appreciates letters from listeners in far away places. While it may take time for the beleaguered staff to get a confirmation letter off, Byron says that all correspondence is answered eventually. Those writing to the station would be advised, if possible, to correspond in Spanish. The station address is Radio Interoceanica, Santa Rosa, Canton el Chaco, Provincia de Napo, Ecuador.

Byron and Olaf both speak of their appreciation for those who responded to the needs of the people in their area following the disaster of 1987. Olaf mentions the special tie to radio listeners in Canada who cared enough to help out a small station in South America.



The station's old medium wave antenna (a dipole) stands about two blocks away from the studios. The FM antenna is on the closest tower, with two shortwave dipoles on either side.

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After a long delay, the new cordless telephones operating in the 902-928 MHz band have begun to arrive in the stores. What do they offer in the way of features and challenges for their users and the monitoring enthusiast?

VTech Tropez 900DX

Monitoring the New 900 MHz Cordless Phones

Panasonic KX-T9000

By Jack Sullivan

I first became aware of these new phones through a brief mention by Bin Mauldin in the *RCMA Journal* nearly two years ago. When I lost both of my 46/49 MHz cordless phones following a direct lightning strike on my home last summer, I decided to wait for the new phones to arrive before investing in replacements. I became a frequent visitor to local electronics stores and scanned the electronic equipment ads in newspapers daily, but uncovered nothing for the new band. Finally, a ham friend mentioned that he had recently looked at one in a local department store and that it appeared to offer a number of interesting features. Within a few days I visited the store and checked out the selection.

Two different units were available: the Panasonic KX-T9000, with 30 channels, and the VTech Tropez DX900, with 20 channels. Both operated in the "900 MHz" spectrum and both were advertised to offer extended range over current 46/49 MHz sets. Both units offered similar operating functions, such as digital security codes, intercom, hold and remote signaling.

The Panasonic instruction book made no mention of exactly how their unit worked. The Tropez instruction book described digital voice modulation and signal encryption, or scrambling, for enhanced security from interception by scanner users. Both units were priced in the $300-400 range, though the Panasonic's list price was $150 higher than that of the Tropez. Intrigued, I decided to put both these pricey pieces of new technology through their paces! (The Code-A-Phone 900 MHz cordless phone was not available for my testing.)

Panasonic KX-T9000

My first surprise with the Panasonic phone came when I turned on the handset after its nickel-cadmium battery pack had been given an overnight charge. Tuning my ICOM R-7000 through the 902-928 MHz band, I quickly found the dial tone on a strong but conventional narrowband FM carrier being transmitted from the transponder (base unit) at 902.1 MHz. (This is the first 100 kHz channel up from the bottom of the band.) The handset carrier was found a few seconds later on 926.1, 24 MHz higher.

The large frequency difference between the handset and transponder is determined by the design requirements of the duplexer circuit in the transponder that allows the handset signal to be received simultaneously with the transponder's outgoing signal through the same antenna without interference. This mixing of the two signals also allows both sides of a telephone conversation to be heard on 902.1 MHz, like the 46 MHz transponder signals of older cordless phones.

Monitoring the handset frequency detected an initial digital burst which is sent when the handset is activated to make a call. Once this burst is received, the transponder comes on the air with the dial tone or incoming telephone call. The advertised one million different security codes are apparently preset in the unit and cannot be changed by the user.

The 30-channel scanning capability advertised for the KX-T9000 is also an automatic function that cannot be activated or controlled by the user. When the handset is turned on, it listens for a signal on 902.1 MHz. Since this signal would not be present from the handset's own transponder until after the digital burst is sent, the phone assumes that this is interference from another set. The handset changes the digital burst and thereby signals the transponder to switch to the next programmed channel along with itself.

This process is repeated until a clear channel is found. Such a mechanism should minimize most of the interunit interference that can be expected in a situation where a number of KX-T9000s are operating in close proximity. It would have been a nice touch to have designed the KX-T9000 to "wake up" on a different channel of the 30 available each time it was used, but apparently the engineers at Matsushita, Panasonic's parent company, felt otherwise.

Another surprise with the Panasonic was the choice of 902.1 MHz as the default transponder frequency. From an engineering point of view, using the first 100 kHz channel available in this band seems to make a lot of sense. Looking at the Amateur Radio Relay League's band plan for the 902-928 MHz spectrum, however, we see that 902.1 MHz happens to be the nationwide calling frequency for this amateur radio band! Hams share this band with low power home entertainment and industrial devices such as cordless telephones and wireless computer data terminals. Users of this band all share it and no one is protected from interference from anyone else! Especially during the VHF contests that are held several times yearly, this channel is frequently used and monitored by amateurs nationwide.

902.1 MHz, which is tunable by many wide-coverage scanners and receivers should become an interesting frequency to monitor for increased activity in the future! The potential exists for significant interference to both cordless phones users and to ham operators in this band, especially in densely populated areas. (Ham use of 902.1 is primarily single sideband modulation.)

Lacking a frequency generator capable of producing a signal at 902.1 MHz, it was not possible for me to test the KX-T9000's frequency scanning function in order to measure the frequency of the other 29 channel pairs programmed into this equipment. Matsushita would not supply me with a service manual for the KX-T9000. It can be assumed that, since the handsets operate in the 2 MHz between 926.1 and 927.9 MHz, the

transponders operate in the corresponding 2 MHz between 902.1 and 903.9 MHz. Channel spacing would be approximately 60 kHz.

Audio quality with the Panasonic was excellent. Taking the handset with me on a local drive quickly produced my second surprise: the unit's range was only about 100 yards, or about the same as what can be obtained with a 46/49 MHz cordless phone. This isn't bad considering the 1 watt or less power levels being used and the stubby 4-inch whip antennas on both the transponder and handset, but it certainly doesn't match up with the "extended range" claim found in ads for this unit.

VTech Tropez 900DX

Several pleasant surprises were discovered while checking out the Tropez 900DX. The manual is clear about the use of digital technology (as opposed to the analog technology used in the Panasonic.) The manual also mentions a type of scrambling used between handset and base for increased security from interception. The manual also describes a novel security code system: each time the handset is turned on by removing it from its cradle in the transponder, a random security code is chosen automatically from 65,000 possibilities. The manual further gives the frequency bands for operation as 925.5-927.4 MHz for the handset and 905.6-907.5 MHz for the transponder. I programmed each of these bands into the search memories of my R-7000 and picked up my freshly charged Tropez handset.

The first sweeps through these band segments found nothing familiar! No conventional radio carriers were on the air, despite the fact that I was listening to the dial tone. Tuning manually with the squelch "open," however, weak but distinct broadband "hash" peaks were found at 926.275 MHz for the handset and 906.375 MHz for the transponder. This broadband digital RF "hash" sounds very different from a receiver's usual squelch noise. Because of the wide bandwidth of these digital signals, the transmitter power is spread over a greater bandwidth and the signal itself becomes much more spread out and thus less conspicuous. Even though I could hear the dial tone clearly in the handset's earphone, only a constant "hash" of digital data came from the receiver's speaker.

Before describing other features of the Tropez, it is important to understand some of the basic principals behind the digital technology used in this set. Figure 1 shows an analog voice waveform. The vertical lines indicate the instants when the analog-digital (A/D) converter chip samples the amplitude of the voice signal and converts that information into a stream of digital numbers made up of 1s and 0s, or bits.

The Tropez sends this data stream to a second chip where the scrambling, or encryption, takes place. Here the bits are rearranged in a specific repeating pattern, or algorithm, by a chip known as a shift register. The encrypted stream of digital bits is then used to modulate the transmitter with on/off pulses that make up the "hash" sound. The same circuitry operates in reverse to convert the encrypted digital bits received by the receiver into clear voice.

The wide bandwidth of the Tropez digital signal is the result of the analog-digital modulation process. To digitally encode a voice signal, it is necessary to sample it at a rate at least twice as fast as the highest frequency of the voice signal. In the case of voice range signals, this maximum frequency is usually assumed to be 3 kHz. Figure 2A shows a conventional analog voice signal. The 3 kHz maximum frequency is both added and subtracted to the center, or carrier, frequency to create a signal that has a total bandwidth of 6 kHz. Figure 2B shows the same signal converted into digital form. The 6 kHz sampling rate of the XID circuit creates a final signal 12 kHz wide, or twice that of the analog signal. The height of the two curves, which represents amplitude or signal strength, is shown reduced in the digital case to reflect the fact that the same power as in the analog case is now spread over twice the bandwidth, making the digital signal sound weaker.

The Tropez uses basically the same system as the Panasonic for minimizing interference. The handset listens for its default transponder signal when it is turned on. If nothing is heard, a digital burst activates the transponder and you are connected to the phone line. If a signal is heard, both the handset and transponder switch to a preprogrammed alternate (20 are available in the Tropez.)

Again, lacking a signal generator, I was unable to confirm the frequencies of the other 19 channel pairs for the Tropez. VTech advertises that the Tropez will change frequency if interference occurs, even in mid-call. They apparently use a 100 kHz spacing between channels. Like Panasonic, VTech doesn't provide service manuals for their equipment.

Like the Panasonic, the Tropez may "wake up" on the same default channel pair every time in the absence of interfering signals. Lacking a spectrum analyzer, this was difficult to confirm. Different frequencies were observed during different tests of the Tropez with my R-7000. There also seemed to be two RF peaks at the same time, 50 kHz apart. Making the matter less clear was the fact that my frequency counter displayed a frequency lower than the "hash" peaks that could be tuned by ear on the R-7000.

I speculated that perhaps the Tropez uses two or more channels simultaneously. Interference to either channel could then be readily detected by counting errors occurring in the compared digital bit streams. A digital command would then signal

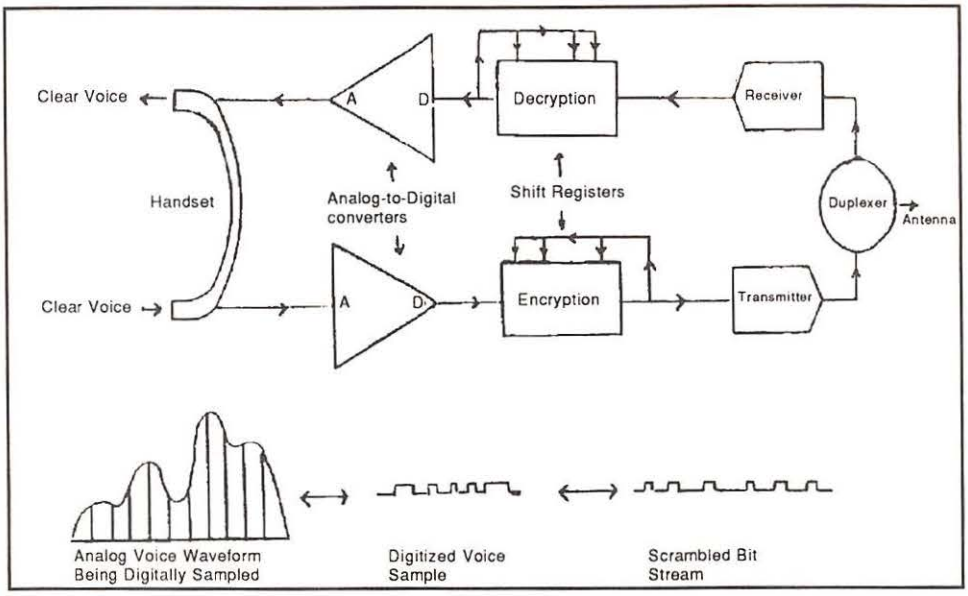


Figure 1: Digital Cordless Phone Basics

the other unit of the pair to switch channels to the next one programmed into its memory.

Audio quality with the Tropez was good but not quite as crisp as with the KX-T9000, a result of the analog-to-digital conversions not being 100% efficient. Audio quality of the Tropez remained unchanged even at maximum distance from the transponder. This is not surprising considering the digital modulation. There is simply no noise, interference or fading as can be found on 46/49 MHz sets. When out of range, the signal just disappears. Step back into range and the signal abruptly reappears!

Range was checked out and confirmed to be at least twice that of the Panasonic, or about 200 yards. This is quite a bit less than the 800 meter (about 800 yards) range advertised for the Tropez. (Interestingly, the warranty registration card that comes with the Tropez asks you to indicate the maximum range that you experienced!)

The Tropez has an out-of-range alarm tone that sounds to alert you so that you can avoid missing incoming calls. The basis behind this feature was found during examination of the RF output of the transponder. When the handset is removed from the transponder, it is "polled" every 13 seconds by a burst of digital RF from the transponder. The handset sends back a digital RF burst less frequently. When either unit stops receiving these bursts, the alarm tones are programmed to alert the user. (Like the Tropez that was tested by the staff of *Popular Electronics* recently, this feature did not operate as advertised during my brief maximum range test. It did, however, work when I unplugged the transponder during a lightning storm. The Tropez handset "bleeped" at me every 45 seconds or so, informing me that it could no longer hear the transponders polling signal.) This out-of-range function works only after a delay of some seconds, so calls might be missed in some cases.

The Tropez and Panasonic did not interact or interfere with each other when operated with the handsets and transponders less than a foot apart from each other. The narrower frequency difference between the handset and transponder in the Tropez (19.9 MHz) may also indicate significantly less interference between digital signals as reflected in the design of the Tropez's duplexer circuit.

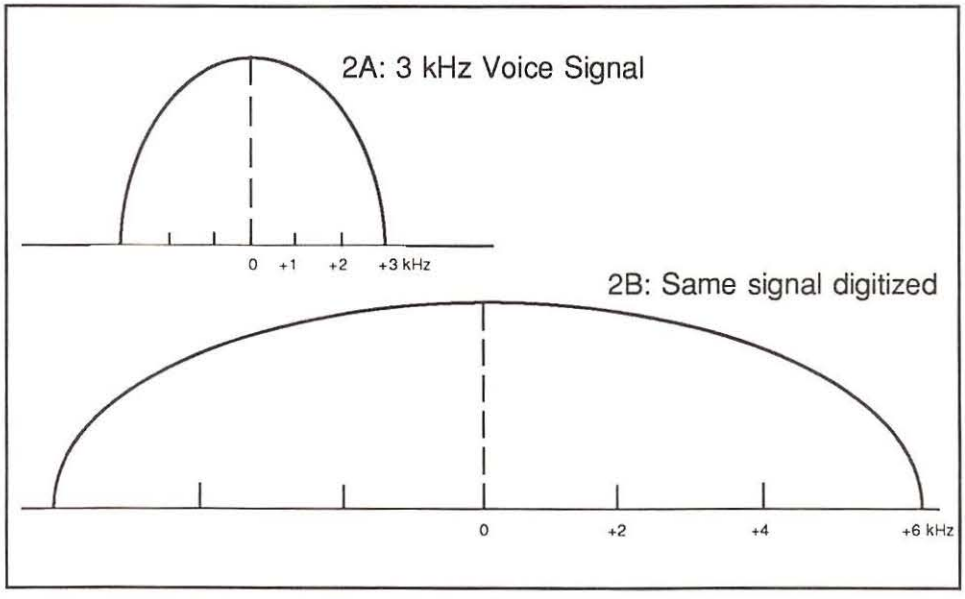


Figure 2: Analog vs. Digital Voice Signals

Conclusions and Monitoring Techniques

You can expect activity to increase in the indicated segments of the 902-928 MHz band as purchases pick up. The general lack of technical knowledge by most consumers and department store salesmen, a "myth" of relative security with cordless phones on this "new" band, and the inevitable interference and conflict with the amateur radio operators and owners of new high tech 900 MHz toys such as wireless VCRs should provide some entertaining listening!

A major difference concerning the "900 MHz" band is apparent from my examination of these two phones. While in the 46/49 MHz band the FCC allocated precisely defined channels for cordless phone operation, the entire 902-928 MHz band is available for equipment designers to use as they see fit (within certain limits such as maximum power). Just about anything can be expected to show up anywhere in this band, including the output signals from the handsets and transponders of both existing and future cordless phones. Searching between 902 and 928 MHz will probably become an interesting pastime for many scanner owners!

Standard scanners and receivers like the ICOM R-7000/9000 that cover this frequency band should be more than adequate. Probably the most critical component of your receiving setup will be the antenna/feedline combination. (MAX System has announced a new 902-928 MHz ground plane—their "900 System"—with an N connector. Tom Bernie, their proprietor, recently sent me one of these units. It works very well! Check their ad in this issue of *MT*.) Any distance between the receiver and antenna beyond a few feet will require the use of solid or double shield "hard line" or coaxial cable to minimize losses at these high frequencies.

The Tropez presents a unique situation. It may be possible to decipher these transmissions using another Tropez handset as a receiver/decsrambler, but the complex nature of the communications between the handset and transponder suggests not. It would be necessary at a minimum to modify the Tropez handset to disable its transmitter and allow only reception (thus preventing the monitoring handset from possibly interfering with the other Tropez and causing it to change channels).

Even though the Tropez is secure from casual eavesdroppers with conventional receiving equipment, assuming that no one will ever overhear one of your calls on this phone would be a mistake. Federal agencies and others who have

a real interest in what you do in the privacy of your own home have probably already received from the FCC the encryption algorithm and operating frequencies of the Tropez and have developed and deployed the hardware needed to "break" the Tropez system. As the courts have uniformly considered cordless phone transmissions to be fair game for interception and possible prosecution, a good rule of thumb is to never say anything over any type of communications equipment that you would not want to hear broadcast from a loudspeaker in the center of Washington, DC!

What can be expected next in the 900 MHz cordless phone race? A lot, if the plans of companies such as Cincinnati Microwave and Cobra are fulfilled and their units become available later this year. Both will employ "spread spectrum," a term used for a communications privacy system originally developed by the military services. In spread spectrum, the handset and transponder operate under microprocessor control and rapidly hop together from frequency to frequency in a seemingly random but coordinated sequence (a "pseudo-random sequence") with the phone's users being unaware of this high-tech electronic activity. An eavesdropper with a scanner or receiver would hear only occasional bursts of noise as he tuned around this band. The Cobra will utilize 100 preset channels to hop among. (The FCC requires that equipment designers use at least 50 channels for this purpose.)

Which modulation technique they will use is not clear from early information, but even conventional FM would be almost impossible to eavesdrop on when spread spectrum is used. The Cincinnati Microwave "Escort" unit will employ digital modulation and other sophisticated techniques.

Approval for release of these units has been apparently delayed by the FCC, even though the technical requirements for "frequency hopping" RF devices are already published by the FCC. This may be giving the FCC time to pass along the frequencies, frequency hopping algorithms and other key information to other federal agencies like FBI, DEA, etc. It has long been known that another federal agency—the National Security Agency which is responsible for breaking codes as well as eavesdropping on just about anyone they want to—has dragged its feet for years on releasing key elements of spread spectrum technology. You have to assume that they have their reasons. Some may find it disturbing to learn that, even in the Land of the Free, the people in charge want to make very sure that you cannot hide your communications from them.

More interesting and exciting developments can be expected to appear in the "900 MHz" band, so why not get in on the ground floor and tune in to something new!

MT

For More Information

• Tropez 900DX (VTech Communications, 8770 SW Nimbus Avenue, Beaverton, OR 97005.)

• Spread Spectrum Sourcebook. 1992. (The American Radio Relay League, Newington, CT or $22 postpaid from Hunterdon Aero Publishers, 1-800-542-7226.)

• The ARRL Repeater Directory - 1992-1993 Edition. 1992. (The American Radio Relay League, Newington, CT.) This handbook-sized directory gives the frequency, location and other information for every ham repeater as well as the band plans for each band. The 902-928 MHz band plan is on pages 40-41. $8 postpaid from Hunterdon Aero Publishers, 1-800-542-7226.

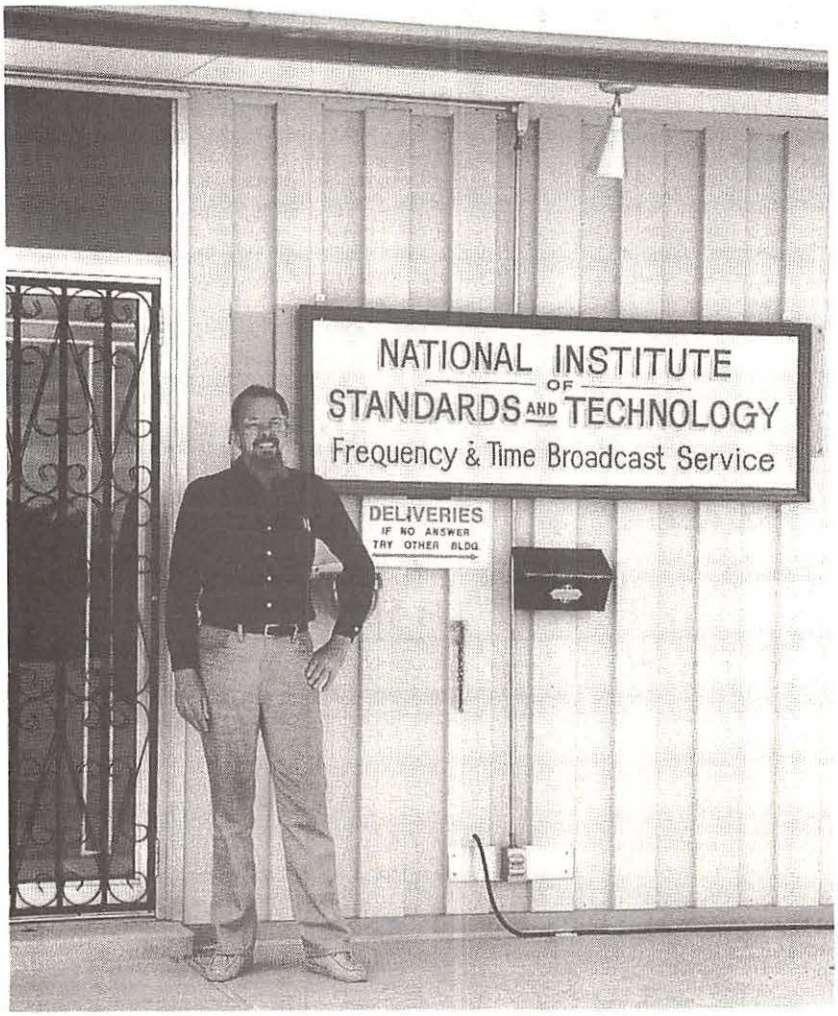
• Code of Federal Regulations, Part 15 (U.S. Government Printing Office, Washington, DC) (Regulations covering low-power RF-radiating devices.)

• Private First-Class Communications (New Product Review of Tropez.) Popular Electronics, July 1992.

It's About Time!

An MT Tour of WWV

By Wayne Heinen
Photographs by Joan Heinen



WWV/WWVB Director Jim Maxton in front of the WWVB building.

As we approach the town of Wellington, Colorado, just north of the city of Fort Collins and head north on I-25, a rather large antenna farm becomes visible off to the west. Turning west on the county road we are soon at a driveway sporting a metal sign: "National Institute of Standards & Technology, Frequency-Time Broadcast Service Radio Stations WWVB - WWV." We follow the dirt road another half mile before arriving at the station buildings and antennas.

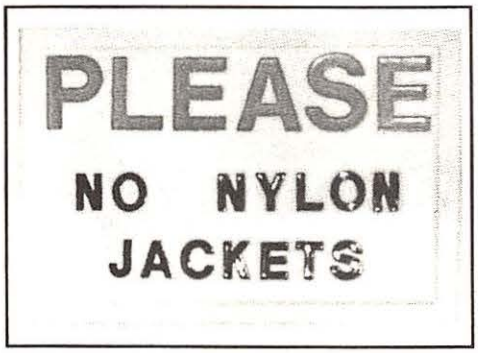
WWV occupies 390 acres on the plains just to the east of the foothills which lead to the Rocky Mountains. Director Jim Maxton greets us at the WWVB building, which houses the 13 kW transmitters for WWVB along with some of the timing equipment.

Calculating the Time

Our tour starts with a basic overview of how WWV arrives at the correct time. This process is a lot more complicated than one might think. Each morning a reading is taken from the GPS (Global Positioning System) navigation satellite and is compared to a small cesium clock in Boulder, Colorado. Simultaneously, the same operation is performed at the Fort Collins transmitter site on one of their reference clocks. These readings measure the differences between the reference clocks. Using a complicated mathematical formula, the difference between the WWV reference clock and UTC is then determined.

At one time a system called the line ten transfer system was used. In this older system, a reading was taken on the leading edge of the tenth line of a particular TV station's horizontal sweep. This was done simultaneously in Boulder and Fort Collins, and the differences between the leading edge of the horizontal sweep was compared to the pulse of the clocks in both locations. This gave the difference between the two clocks in Boulder and Fort Collins which then could be used to calculate the difference between the reference clocks and UTC.

The new GPS antenna is a helical enclosed in a small plastic bubble at the top of a mast on the WWVB building. The Yagi that was used in



the line ten system is still mounted below it.

As we enter the WWVB building, the first equipment we're shown is the GPS receiver and the associated microprocessor that takes the readings and records the difference between the WWV reference clocks and UTC. The comparator system selects the reference clock that is the closest to UTC and has that on line. The best reference was running about 12 micro seconds fast according to the printout that Mr. Maxton ran for us. "However, that does not mean that we're transmitting 12 microseconds off. We enter corrections to the timing system so that we are transmitting the correct time."

A Tour of the Buildings

The two transmission facilities are basically identical. But before we head down to the WWV building, a few things of interest are noted at the WWVB building. There is a sign on the door to the clock and RF Oscillator room: "Please, No Nylon Jackets." Jim explains, "Some of the equipment in this room is rather sensitive to static electricity. That's why the sign and the fact that the room is totally shielded to keep stray RF out."

The transmitters used at WWVB are affectionately known as "Blue" and "Gray" for their unique paint jobs. These were originally old military transmitters that were stripped down and converted to run on 60 kHz.

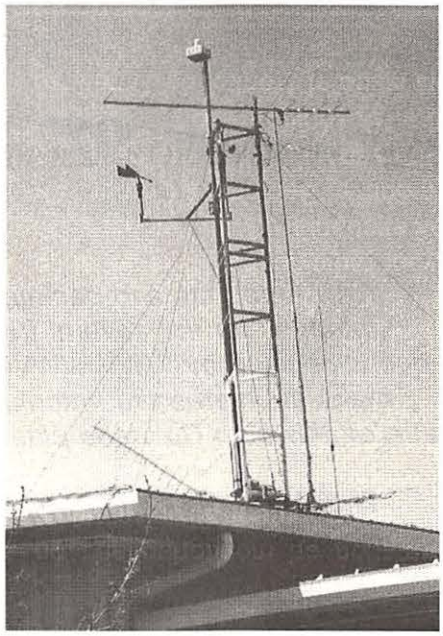
We take the car down to the WWV building because of the 35 mph winds that are blowing. Upon entering the building, we are greeted by technician Matthew Deutch and Charles Snider, the other technician, who is busy in the repair shop.

Matthew stops us at the clock and oscillator room. This is known as the "Screen Room" because it is shielded from all outside RF. Here there are racks with three identical sets of clocks. These are the ones that "time" WWV. Matthew explains, "We are currently running our most stable clock. The others are constantly being compared so that we know that we are putting out the proper time."

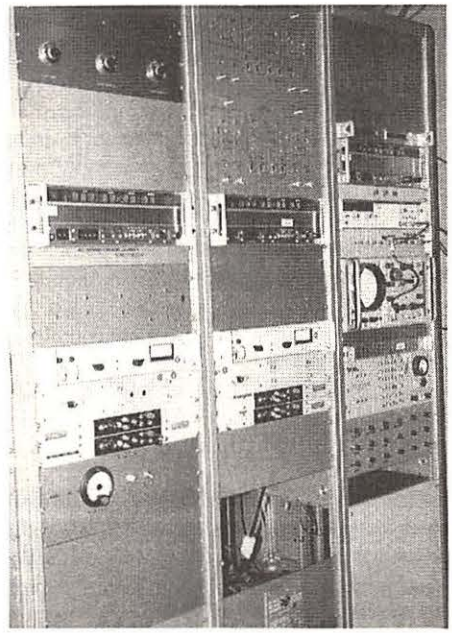
He continues, "The cesium clocks put out a steady 5 MHz signal. This signal is multiplied or

No SWL is worth his or her salt without MT on the desk, open, next to the radio!

Herbert Newberry, Jr.
Mansfield, GA



Yagi near top was used with Line 10 System. GPS antenna is white ball element on top.



Clock RF Oscillator, frequency counter and WWVB controller.

divided by 'Time Code Generators' in order to provide the proper RF frequency for each of the transmitters—2.5, 5, 10, 15 and 20 MHz—that WWV operates on. The audio tones and the time ticks are all derived from the cesium clocks. The time code generators control all of the audio portion—the tones, time ticks and time announcements."

The voice message console is where the voice recordings are made. The weather announcements, geo-alerts and all other announcements are phoned in and recorded on the appropriate tape. The time code generator knows what minute it is and switches on the appropriate tape. During the 18th minute, we all get to hear the A Index, K Index and solar flux which are used to predict propagation.

It was a surprise to find the old drum recorder with the voice of Don Elliott Heald still operating at the time of our tour. The new time code generators that were installed about a year ago have the new digitized voices that you hear. Many people are unhappy with the new voice of the digitized system. Jim Maxton assures us that a another new voice is going to be used and the digitized messages will be rerecorded by an announcer named John Doyle. After being treated to a preview, we agree that Mr Doyle's voice will be very pleasant to hear over WWV.

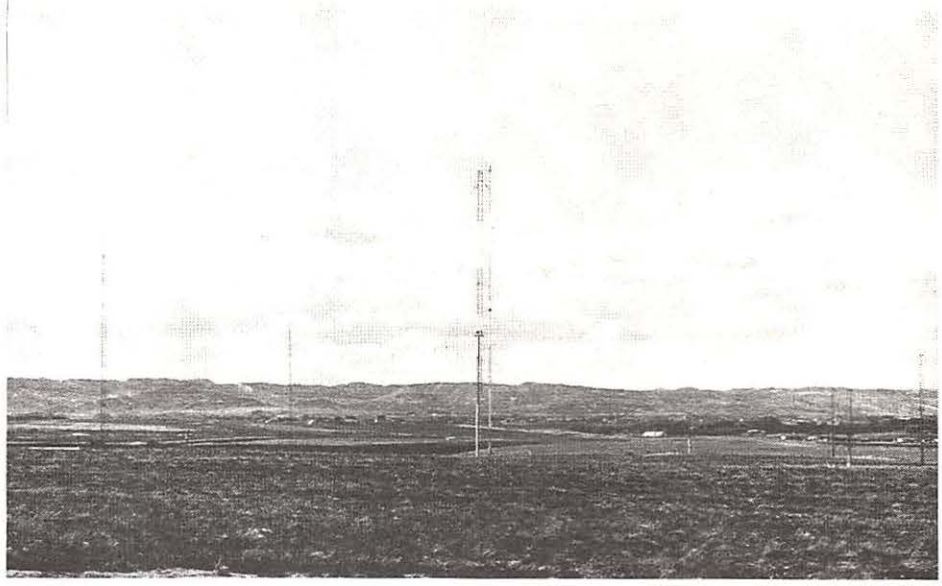
The mention of WWV going to Daylight time a month earlier than they should have (see "Communications," May '92 *MT*) was due to an error in programming of the new Time Code Generators. "It was an error in entry. Unfortunately, there is no display of the program that's currently running," was Director Maxton's comment.

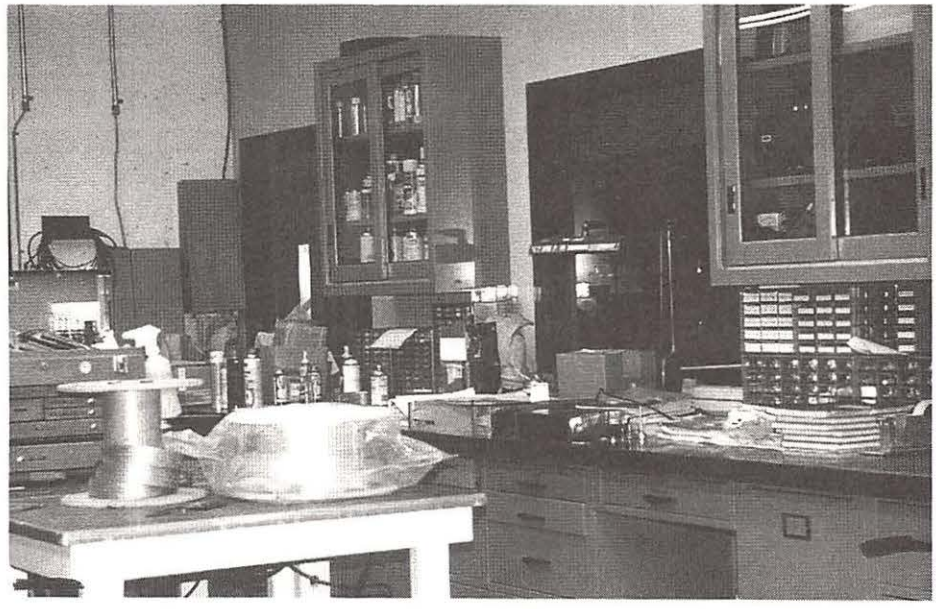
Next we view the WWV transmitters. Each frequency has one on-line and one standby transmitter. The new on-line transmitters run Class C operation, while the old transmitters ran Class AB. The more efficient Class C transmitters really help out the electric bill. Prior to their use, WWV ran an average of $10,000 a month for electricity; now the bill is around $7000. The transmitters are in a hallway that completely surrounds the shop. Outside of that hallway is another hallway. This allows access to the rear of the transmitters for repair. A full color schematic diagram of the transmitter's circuitry hangs on the wall.

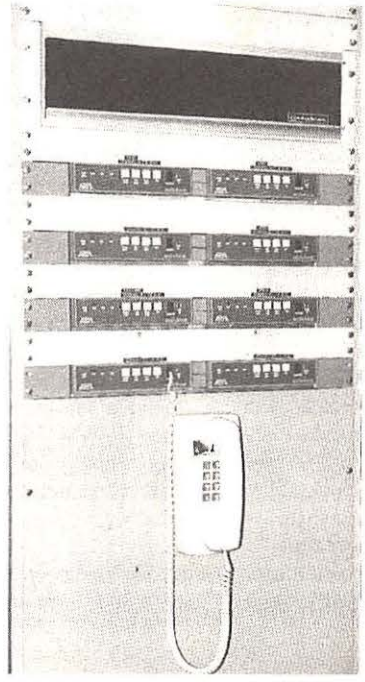
Through the second hallway we are led to the power distribution area. This is also where the backup generator is located. If power fails, WWV and WWVB will continue to broadcast, as both have separate backup generators.

A View of the Farm

Now we turn to the "antenna farm" for WWV. Each transmitter feeds a separate 1/4 wave vertical antenna. WWV employs two



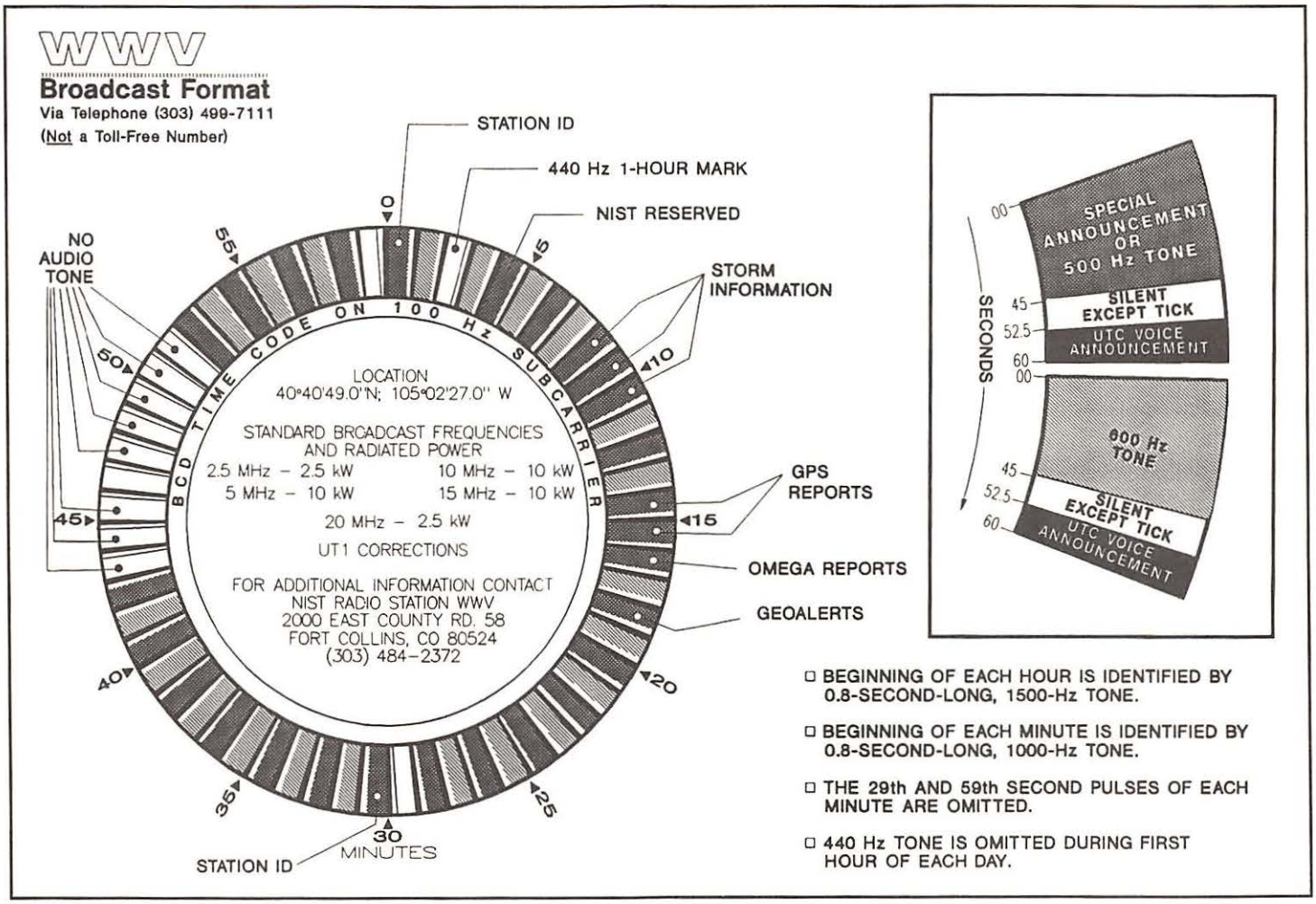




Top: *Antennas and back-up antennas for the several frequencies used by WWV/WWVB make an impressive antenna farm on this high Colorado plain.*

Middle: *In the center of the building is the WWV repair shop.*

Right: *The various voice announcements are phoned in and recorded for automatic playback on the correct minute.*



wideband backup towers for the five frequencies.

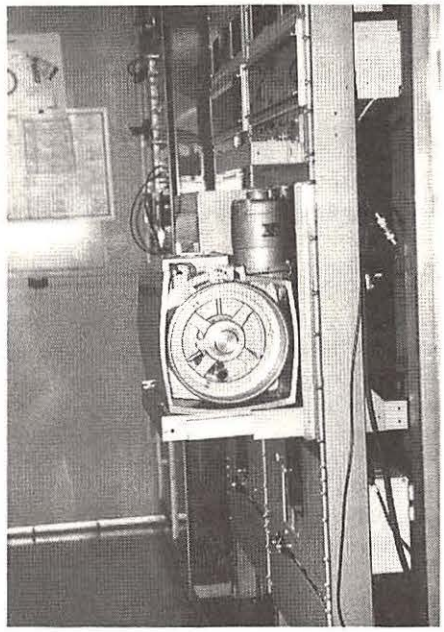
Walking out the rear of the building, we climb a small flight of stairs to an observation platform. There we get a good view of all seven of the towers that are used, as well as the feed lines that are mounted a foot off the ground.

WWVB has a large top loaded antenna system consisting of four towers in a diamond formation and a backup of the same size. This is best seen from the road.

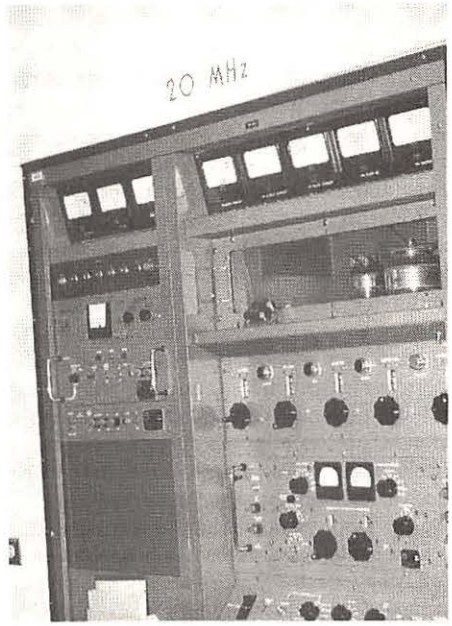
Walking back through the WWV facility, we spy the QSL board in the front hall. This board sports ham and SWL cards from signal receptions around the world.

We express our thanks for *MT's* specially-arranged tour of WWV. Sadly, WWV and WWVB are unable to accommodate tours due to the lack of personnel. They do, however, have a publication which is available for the asking that explains about WWV, WWVB, WWVH and the services that they provide. The chart in our sidebar is from the book and shows a WWV "Hour" and a WWV "Minute." Their address is in the middle of the "Hour." When writing, request NIST Special Publication 432, and let them know that you enjoyed *MT's* special tour of the station. MT

Wayne Heinen is a veteran radio hobbyist who serves on the Board of Directors of the National Radio Club, is licensed amateur radio operator N0POH and is Police Beat editor for the National Scanning Report.



The drum recorder with the voice of Don Eliott Heald was seeing its last days at the time of our visit.



There was an on-line transmitter and a back-up for each frequency—2.5, 5, 10 and 20 MHz. Pictured is the on-line transmitter for 20 MHz.

The Day the Martians Landed

Or Stories They Never Tell on HCJB

By Don Moore

Remember when the Martians invaded? Of course!—it was back in Grandpa's time. We hear about it every Halloween. On October 30, 1938, Orson Wells presented a dramatization of "War of the Worlds" on the CBS network. Wells' Martians landed near Princeton, New Jersey, and proceeded to wreak havoc on the surrounding countryside.

Well, maybe there weren't really any Martians, but the broadcast certainly created havoc across the country. Millions of Americans tuned in after the opening credits and thought the invasion was for real. As police stations were swamped with phone calls, many city-dwelling Americans jumped in the family car and took off for the safety of the country. Others went off in search of a priest to give a final confession. At New York City's naval base, shore leaves were canceled and sailors were called back to their ships. In short, panic seized the entire nation.

How could Grandpa have been so dense as to actually believe that Martians really had landed? And now every year we wave it about for the world to see—look, everyone, at how we got fooled in 1938! It's sort of a blemish on the national IQ.

Well, fortunately we're not the only ones to get bowled over by imaginary Martians. Just eleven years later it happened again, south of the equator, in Quito, Ecuador. The Ecuadorians got taken in just as bad as Grandpa did, but their reaction was, well, a little bit stronger.

The Martians Land

Nestled at the foot of Mount Pichincha, in a fertile Andean valley, Quito has always been as peaceful as a city could be. When the 1940s came along, Quito may have lagged behind the rest of the world in some things, but communications was not one of them. In downtown Quito, next door to the Ministry of Communication, was the three-story Comercio building. This was headquarters for Quito's premier newspaper, *El Comercio* which was respected throughout Latin America. Also in the same building was Radio Quito, owned by the newspaper, and the most popular radio station in the city.

In February 1949, Leonardo Paez, the art (program) director of Radio Quito and Eduardo Alcaraz, the station's dramatic director, were looking for something new and exciting to do on the air. Something that would really draw attention to Radio Quito. They had heard of Orson Wells' famous "War of the Worlds" program, and that seemed to have just the level of excitement they needed.

A script was drawn up and actors and sound effects were arranged for. Paez and Alcaraz saw no need to tell station management about their plans. It was just another drama production. Finally, on Saturday, February 12, 1949, everything was ready to go.

As usual, listeners in Quito and surrounding towns tuned in to Radio Quito's evening newscast, which was followed by the nightly music program. Suddenly, an announcer broke in mid-song, "Here is an urgent piece of late news!" He then gave a long and frightening description of how Martians had landed twenty miles south of the city, near Latacunga. Latacunga had already been destroyed and the aliens were approaching Quito in the shape of a cloud. A few minutes later came another announcement: "The air base of Mariscal Sucre has been taken by the enemy and it is being destroyed. There are many dead and wounded. It's being wiped out!"

The broadcast now took on an eery reality, as different actors stepped up to the microphone, some chosen for their ability to sound like well-known public officials. First, the "Minister of the Interior" arrived, and urged citizens to stay calm to help "organize the defense and evacuation of the city."

Next, it was the "mayor" of Quito's turn: "People of Quito, let us defend our city. Our

women and children must go out into the surrounding heights to leave the men free for action and combat." Then a priest begged for mercy from God as a recording of Quito church bells ringing in alarm was played in the background.

The prayer was interrupted for a telephoned report from an announcer at the top of Quito's tallest building. He described a monster surrounded by fire and smoke coming towards the city. More reports were telephoned in from residents of the nearby village of Cotocallao, which was now under attack.

Panic in the Streets

By this point, the population of Quito was in panic. The city's streets filled as thousands fled their homes, many wearing their pajamas. The noise in the streets was the first inkling Radio Quito had of what they had done. An announcer came on and revealed that the broadcast was entirely fictional. Station staff members, many trusted voices, "frantically" pleaded for calm in the city.

Radio Quito's appeals did nothing to calm the mobs in the street. In fact, hearing that the whole thing was a hoax angered people even more. From all directions, thousands converged on the El Comercio building and began stoning it. About 100 people were in the building when the riot began. Most were able to escape the mob through a back door, but some were forced to flee to the third floor. The police and army were called to come put down the riot, but they were already busy. They were on their way to Cotocallao to battle the Martians.

More rioters arrived. Some brought gasoline, others had crumpled copies of the *El Comercio* newspaper. Gasoline was used to fuel the fire as dozens of burning *El Comercios* were thrown at the building. Soon, the building was engulfed in a mass of flames which began spreading to nearby buildings. Several dozen people were still trapped on the third floor. Some leapt from windows to escape the flames. Others tried forming a human chain to climb down, but the chain broke and most crashed to the pavement.

Finally, the police and army arrived, but it was only with tanks and massive doses of tear gas that the crowds cleared, making room for the fire trucks. The fire was put out before it caused extensive damage to nearby buildings, but it was too late for the *El Comercio* building. Only the front was left standing. The presses, radio equipment, and the newspaper and radio station files were destroyed, leaving $350,000 in damage, an astronomical sum in 1949.

More tragic was the human cost. Twenty people died in the fire, or trying to escape it. Fifteen more were injured.

Radio Quito Rebuilds

The next day, the staffs of *El Comercio* and Radio Quito began picking up the pieces, except for Paez and Alcaraz, who were indicted. Other Quito and Guayaquil newspapers offered their presses so that the newspaper could continue printing. Gradually, the paper and the radio station were rebuilt, and they regained their positions as the most respected media in Quito.

Apparently neither wants to remember the most memorable event in their past, however. In a 1980 article on the 40th anniversary of Radio Quito, *El Comercio* didn't include a single sentence about the Martian broadcast.

Today, Radio Quito is a not-too-difficult catch on 4920 kHz in the sixty meter band. It can be heard most evenings until 0400 sign-off, and mornings after 1000 sign-on. Programming is mainly news and sports, with occasional radio dramas. But, don't expect to hear any science fiction. Radio Quito stopped doing that sort of thing a long time ago.

MT

Shortwave Broadcasting

Glenn Hauser
Box 1684-MT
Enid, OK 73702

All times UTC; all freqs kHz

ALASKA From Sept. 27, KNLS in English plans to use 7365 at 0800, 7355 at 1300 (*ADXN*)

ANGOLA Active provincial and regional RNA stations: Benguela 5041.2, 6154v. Cabinda 4970. Huambo 3345. Huila 7350, 4820.3. Lobito 11815v, 7151v, 5043. Lunda Sul 4860. Moxico 5091.2. Namibe 5015/5402. International Service, Luanda has English 2000-2100 on 9535, 3355 with news at 2030 (BBC Monitoring) VORGAN, 7290, audible until almost 0700, so suspected from more northerly and westerly location than Jamba (Craig Seager, *Australian DX News*)

ARMENIA Radio Yerevan has daily coverage of Azeri genocide of Armenians in Karabagh, and of valiant defense of those isolated 150,000 Armenians, 0230 in Armenian, 0240 into English on 11790, better on 15580; one hour later presumably from Sept. 27 (Helen Takessian, Tucson, AZ) The night I checked, English from 0244 on 15580 but announced only 13645, 11675, 11790. Usually different for winter (gh)

AUSTRALIA Print-Handicapped stations have moved below 1600, but replaced by others—now's the time to get them before North American stations fill up band (gh) Royal Newcastle Hospital, NSW on 1629, often just music, but Wed. and Fri. relayed 2NC 1233 at 0800-0810 including local news 0805 (Ian Stanley, Vic., *ADXN*)

AUSTRIA We've pressed R. Austria International to shift morning broadcast from 1130 to 1230 when it would propagate further into North America on the 15 MHz band, like Finland which is so reliable on 15400. Half our wish is granted for the W-92 season from Sept. 27, now 1230 but still on 13730, including *SW Panorama* on Sunday, but it's no longer at 0630 Monday via Canada 6015; added at 2330 Sunday on 9870, 13730 for Latin America; Monday 0330 on 13730, 9875 North, 9870 Latin. Remaining times to other targets are Sunday 1330 on 17730, 15450, 1630 on 11780. The six-month conflict with WYFR at 0330 on 9870 should be resolved by move to 9775; 9870 resumes end of March (gh)

BRAZIL R. Guaiba, 6000 and 11785, heard from 0337 to closing at 0405 also on 5280 (G.I. Barrera, Chile, Radio Nederland *Radio-Enlace*)

CANADA RCI is replacing three obsolete 250 kW transmitters at Sackville with new ones costing $6.2 million, one a year starting Sept. 1993 (Moncton *Times* via Jim Elgee, *DX Ontario*) Relay arrangements probably helped get this approved (David Clark, *DXO* ed.) One RCI transmitter failed in mid-August, so several frequencies were dropped (BBCM) Padula misunderstood our QSL policy—though strict, proxy QSLs are not disallowed (Paul Ormandy, New Zealand DX Radio League, *World of Radio*) Larry King added CFRB, 1010, Toronto to his affiliates in late August; probably doesn't even know this also puts him on CFRX, 6070 (Tim Hendel, FL) Original plan was to pick up the repeat only after 0606 UTC (Laurence Palter, Ont., *Usenet* via George Thurman) But confirmed live at 0306, maybe a help if you can't find him on AM, though Germany 6075 is a problem (gh)

CHINA Effective Oct. 1, Radio Beijing will be renamed China Radio International, CRI (R. Beijing in Hindi via BBCM) To be believed when heard in English, as previous announced plans did not take place (gh) Guizhou PBS, Guiyang, has English lesson daily 0530-0600 on 7275, 3260 (BBCM)

COLOMBIA R. Nacional in USB back on 17862.8 varying to 17865.5 at 2200 (Wolfgang Bueschel, Germany) Radio Las Lajas, at famous canyon pilgrimage town Ipiales on the Ecuadorian border, heard at 2052 with RCN net, ID on 5800, 5th harmonic of 1160 (Yimber H. Gaviria, Popayan, HCJB *DX Partyline*)

COSTA RICA The Haitian Creole program on Radio for Peace International, Saturdays 2000 repeated 8 and 16 hours later, is called *Radio Neg-Marron*, literally "black and brown," for all Haitians (Tim Hendel, Miami, FL) *Neg-Marron* means black flight, e.g. where slaves escaped. Sponsored by Rocklanders for Democracy, a group in that southeast New York county (RFPI) How many Haitians can contact them via the announced fax number, 914-358-4924? RFPI found on 7385 in addition to 7375 (Hendel) It's the 21465 transmitter moved here in the 0000-0800 period only due to jamming of 7375. New 30-kW transmitter still under construction, 7-1/2 x 4 x 8'; should put whopping signal into North America, improve by three to four S-units with 6-element cubical quad on 45-meter tower in a month or two; 7375 and 7385 may swap AM and USB depending on interference (James Latham, RFPI *Mailbag*) Other frequencies are 15030, 13630-USB; *World of Radio* times: Sunday 2300, Monday 0700, Tuesday 1900, Wednesday 0300, 1100, Friday 2000, Saturday 0400, 1200, 1800, Sunday 0200, 1000. Some could change for fourth quarter. See also USA

CROATIA Hrvatski Radio on 6511 at 0130 rap music parallel to 6210, perhaps ex-5085 not heard (Hans Johnson, MD, *Fine Tuning*)

CUBA RHC in English to North America at 0000-0500 on 11950, 0500-0700 on 9550; also USB nightly 0000-0200 on 13660. Another SSB transmitter is being refurbished, perhaps for winter nights in the 7.3-7.6 MHz band. I'm trying to start an SWL net, Sundays 1200-1230 on 14340 (Arnie Coro, CO2KK, RHC *DXers Unlimited*) Also USB in Spanish to Europe 2100-2300 on 13660 (RHC *En Contacto*) Coro claimed "rumbling" on 11970 was "malicious interference," but any ten-year-old could recognize that distorted mess as a defective transmitter, the same now heard on 15230 from 1300 in Spanish (Ernie Behr, Ont., *W.O.R.*)

(non) La Voz del CID, R. Camilo Cienfuegos, uses 6305 at 0420-1200 including *Voices of internal resistance* daily at 0310-0320, news from Spanish-language Miami stations at 1100-1130; and on 9940 at 1208-0415, hour-long news at 1600, 0000. R. Antonio Maceo service uses 11940 at 1208-2315, 7340 at 2320-1200 (BBCM)

CZECHO At least for the summer, the external SW site Litomyshl in Bohemia and Moravia used 17725, 13715, 6055; and between 2300 and 0430, 7345; see SLOVAKIA

ECUADOR While the 21455 SSB transmitter obtained from the Swiss PTT has continued, HCJB has been refitting the other one formerly on 25950, both now duplexed to single antenna, unterminated 4-band rhombic, bi-directional toward Europe/South Pacific, 10 kW each with 30% carrier insertion. Tested 17535 in August, 17490 in September; may be regular from November (Rich McVicar, HCJB *DX Partyline*) On Tuesdays, *Happiness Is* travels around Ecuador, sometimes other countries, e.g. UTC Wednesdays 0100, 0300, 0530 (HCJB *Program Notes*) Radio Nacional Espejo, Quito, long on 4680v and previously 4635 as announced, has finally been heard on officially assigned frequency shown on letterhead, 4880 (McVicar, *DXPL*) Radio Paz y Bien reactivated on 4819.78 at 0950 Sept. 1 (Hans Johnson, MD)

GUAM Typhoon Omar with winds up to 150 mph caused no staff injuries; KTWR transmitter building flooded and water damage to generators (Chuck Roswell, TWR Bonaire) KSDA also lost power and generator was out for repairs (Horlock, KSDA, via George Thurman, *W.O.R.*) Both stations back on (Arthur Cushen, RN*MN*)

GUINEA Rdif. Nationale uses 9650, 7125, 6155, 4910 at 0557-0805 Monday-Saturday, 0800-1230 Sunday, 1215-2400 daily in French, Maninka, Soussou, Pular; English news irregular at 1845-1855; previously on 15310, 4833, all varying 1-3 kHz; IDs include R. Conakry, R. Guinea (BBCM) 7125 and third harmonic 21375 heard after 2300; 21375 also at 0600-0800, 1500-2300+ (Harald Kuhl, *Funk*, via W. Bueschel, Germany)

IRAN (non) V of the Mujahedin of Iranian Baluchestan, believed from Iraq at 1258 to 1455 on 11970 (BBCM)

IRAQ Baghdad on new 4930 ex-4750 until 2326 (Brian Alexander, PA, *W.O.R.*)

(non) News Centre of Free Iraq (Arabic: *Markaz Akhbar al-Iraq al-Hurr*) used 11945 at 2200-2353, believed same as on 15190 in March, connected to V. of Iraqi People (BBCM) Voice of Rebellious Iraq in Arabic: *Sawt al-'Iraq al-Tha'ir*; Kurdish: *Dangi Iraqi Shurashgar*. Supports Iran-sponsored Shiite Supreme Assembly under Muhammad Baqir al-Hakim, in Arabic, some Kurdish, times and frequencies vary: 0330-0600, 1130-1400, 1630-1900 on 8150 and 7090, varying 8000-8200 and 7050-7100; one hour later during winter time (BBCM)

ISRAEL Kol-Israel already shifted one hour later Sept. 6 with the end of DST; until November 1, English: 0500-0515 on 11588; 1100-1130 on 17545; 1400-1425 Sunday-Thursday on 17590, 17575, 15640, 15590, 11605, 11587; 1800-1815 on 17575, 15640, 11675, 11587; 2000-2030 on 17575, 15640, 11675, 11605, 11587, 9435; 2230-2300 same except 11603 (IBA) During marginal reception, we had trouble understanding other announcers, but the clear voice of Ben Dalfen came through with no problem for *DX Corner*, the last few minutes. If the bottom line is being heard and understood, they should have Ben do more announcing (gh) Arabic home service at 1900-2110 on unlisted 7813.45 USB, peaking around 2030, feeder? (Karl Leist, Munich, Germany) Now scheduled 0400-2215 on 5900, 5915, 9815, 15480, perhaps also 15095.

JAPAN Radio Japan still won't put *Media Roundup* on when Sackville can relay it, and the Sunday 2130 airing via Gabon shifted from 11735 to 11925. From Sept. 27, the Skelton, Britain relay Sunday at 2330 drops 6025 and 6160 for 6050 and 6125. Try the UTC Sunday 0330 airing first on 17810 direct which sometimes makes it; 1530 on 11865 direct supposed to continue at least through October. Skelton relays in the morning from Sept. 27 might reach North America better than 17825 and 15230 direct: 0500-0600 on 7280, 6085; also at 0700-0800 on 5970, 6025 (via Diane Mauer, WI)

KOREA NORTH R. Pyongyang with Stalinist choral singing in Japanese on 26240, 19680 and 13120, harmonics of 6560 at 0933; V. of National Salvation, clandestine for Korea South on 18029.7, which is 3 x 6009.9, escaping jamming via harmonic only at 1103 (Ralph Famularo, Japan, SPEEDX)

KURDISTAN V. of the Kurdistan Revolution reported a Kurdish official had visited the station located in Sulaymaniyah (BBCM) a.k.a. northeastern Iraq; see August *National Geographic* for a good map of Kurdistan on p. 37

LIBERIA ELWA is back on the air with FM, plans to resume shortwave in 25 languages with two 10-kW transmitters (HCJB *DXPL*)

MONGOLIA Domestic service frequencies in summer schedule are 4000, 4080, 4762, 4823, 4838, 4854, 4870, 4901, 5000, 7317, 12000 (R. Ulaanbaatar via John Crellin, BDXC *Communication*)

MOZAMBIQUE BBCM continues to suggest A Voz de Renamo comes from Gorongoza, but the author of a Johannesburg *Star* article, who visited the Renamo base there says no sign of transmitter or antenna at this primitive camp. So theory that it could come from Kenya is not so far-fetched; Malawi another possibility (Vashek Korzinek, RSA, *NU* via DSWCI)

NETHERLANDS RN W-92 schedule from Sept. 27: Asia 0030-0325 on 11655, 9860, both Madagascar. Pacific 0730-1025 on 11895, also 0730-0825 9630, 0930-1025 9720. Europe 1130-1325 5955. Asia 1330-1625 17610, 13770, 1430-1625 also 15150, 9895. Africa 1730-1930 21590, 21515, 9605, 6020; 1930-2025 21590, 17605. North America adds early third transmission at 2330 on 6165-Bonaire, 6020-Flevo; 0030-0125 on 11835-USB, 6165, 6020; 0330-0425 on 11720, 9590. At the new times on Thursdays, 1250 and 2350, *Research File* airs instead of *Media Network*. We have no pennants, but plenty of programs (RN*MN*) *In So Many Words*, the 12-part series on European languages, is to be repeated on Wednesdays starting Sept. 30 (Andy Sennitt, *SW Echo* via Baxter)

NEW ZEALAND RNZI schedule effective Oct. 4: 1650-1849 on 9675, 1850-2138 on 15120 both Sunday-Friday; 2139-0658 on 17770, 0659-1207 on 9700 both daily; 1208-1649 on 9510 occasionally (Adrian Sainsbury, RNZI) *Calling Pitcairn*, Friday 0430 to appear Sept. 25, and four weeks later, Oct. 23, etc. *Around the World with Rudi Hill* the following weeks, prepeated Tuesdays 0930, assuming no timeshifts.

NORWAY Foreign Ministry has decided to withdraw funding of R. Norway International next year (Edwin Southwell, U.K., *DX Listening Digest*) Financing for weekend English broadcasts is under review, could lose it. Better write in support to: Radio Norway International, NRK, N-0340 Oslo 3, Norway (Bob Thomas, CT, *DXLD*) Write to the Embassy for best results (RN*MN*)

PAPUA NEW GUINEA Radio Gulf, 3245, has English news at 1110, regular at least weekdays (David Norcross, Guam)

RUSSIA AWR schedule showing English at 1600 on 9775 is a misprint, still 15125 (Wolfgang Bueschel, Germany) *R. Aum Shinrikyo*, very bizarre religious program in broken English heard on most RMWS frequencies at 0430 and 2030, same text and weird song every day (Ernie Behr, Ont., *World of Radio*) So it's like an info-mercial, must be great source of foreign exchange for RM! (gh) RMWS program schedule expiring Sept. 26 showed regional programs which may continue: *Focus on Asia & the Pacific*, Mon.-Fri. 2100-2130, Tue-Sat. 0000-0030, 0500-0530, 0800-0830, 1200-1230, 1500-1530. *Africa As We See It*, daily 0530-0600, 1530-1600, 1830-1900 (via Gigi Lytle, TX, *DXLD*) Amend R. Vostok schedule in September to show it silent on Saturdays. And its 7210 carries R. Stantsiya Tikhiy Okean at 0715-0800 (Yoshinori Kato, R. Japan *Media Roundup*)

SAINT HELENA *To promote tourism, Radio St. Helena will make an annual shortwave broadcast. This year R. St. Helena Day is Friday, Oct. 23,* at 2000-2100 and 2220-2300 on 11092 SSB. Listeners worldwide are invited to call Tony Leo during the transmission, dial direct to +290-4654. Reports are invited, for QSL card and informative letter, reply postage highly appreciated to Radio St. Helena, Jamestown, St. Helena, South Atlantic Ocean. There is no airport, and the island is currently served every six weeks by the *RMS St. Helena* sailing between Cardiff and Capetown. For further info about St. Helena, contact South Atlantic Travel & Trade, Box 6013, S-600 06 Norrkoeping, Sweden (Jan Tuner, SATT, who visited St. Helena earlier this year, *DXLD*) Slight variation in details, 11092.5, and 2020-2100, 2220-2300, phone 290-4669; both transmissions live with same content except for overseas calls (Jenny Tuner, daughter, visiting HCJB *DXPL*)

SEYCHELLES FEBA's Sept.-Oct. schedule shows English to South Asia at 1500-1555 (Sunday 1558) on 11710; separate international *Network* program also 40° to South Asia. Monday-Saturday 1500-1600 on 9810, 15330 (*World of Radio*)

SHRI LANKA See last month; the TWR SW frequency registered is 6035 (Victor Goonetilleke, ibid., RN*MN*)

SLOVAKIA At least for summer, RCI transmissions from the two sites here were: Velke Kostalany on 9810, 9580, 9505 whenever used,

and 7345 at 1400-2130; Rimavska Sobota on 21705, 15520, 11990, 11685, 9605, 5930; and on 7345 at 0600-1300, 15355 at 0400-0430. See also CZECHO (*DXLD*)

SOMALIA The original Radio Mogadishu is inactive on shortwave 7200. The opposition Radio Mogadishu varies 6956-6972 on AM, or 9425-9535 on USB plus carrier, at 0400-0500 (Fri. 0600), 1000-1100, 1400-1430, 1600-1900, mostly in Somali except 1730 news in Arabic, 1830 news in English (BBCM)

SOUTH AFRICA R. RSA finally found a taker for transmitter rental—BBC! (gh) Registered 15420 at 1745-1900, 17790 at 0700-0730 (RN*MN*) Radio RSA itself in English for Sept.-Oct.: 0200-0400 9730, 0300-0500 3995, 0400-0700 15220, 1000-1200 11900, 1600-1800 9565, 11885. Domestic SW mostly in Afrikaans: R. Suid-Afrika, 0300-0500 3980, 0440-0655 7285, 0640-1640 11770, 1630-2300 3980. R. Orion, 2300-0300 3980. R. Oranje, 0300-0510 3215, 0515-1615 9630, 1620-2200 3215 (via Bill Westenhaver, *DXLD*)

SPAIN SFR in English to Africa 1900-2000 on 9675, Europe now 2100-2200 on 6125 (via Edwin Southwell, UK)

SUDAN National Unity Radio, nominal 9535, but heard on 9190 or 9170v at 1300-1700 including English news 1500-1515; very erratic, sometimes R. Omdurman instead, is on lower frequencies to shadow Radio SPLA, which started using 9170 at 1300, later monitored at 0500-0600, 1100-1200, 1300-1400 on 9170 or 9190, in Arabic, Sudanese colloquial Arabic, local languages; except for opening announcements, no more English heard (BBCM) R. Omdurman also on 9190 in English at 1800-1900, including *Introduction to Sudan*, Thursday 1823; *You and Your Health*, Friday (Southwell, UK, *W.O.R.*) Also 2125-2200 in Arabic, strong parallel 7200 weak, latter also from 0248 (Brian Alexander, PA, *W.O.R.*)

SWAZILAND Swazi Radio has dropped "Commercial" from its name, since it's now paid religion only; address is now P.O. Box 5572, Rivonia 2128, RSA. 9750 is inactive, but 6155 operates Mon.-Fri. 1700-2030, Sat. 1700-2000, Sun. 0500-0600, 1700-2045. Using same facility is R. Cidade, ex-R. Paralelo 27, by Communities Broadcasting Services, Doornfontein: Mon.-Fri. 0700-1000 in Portuguese, Sat. 0600-0900 Italian, 0900-1200 Port., 1200-1700 Port. and Eng.; Sun. 1100-1200 Greek, 1200-1500 Port. (Maarten van Delft, RSA, *DXLD*)

TAIWAN From Sept. 27 to Mar. 28, WYFR relays VOFC in English: 0200-0300 11740, 0200-0400 9680, 5950, 0700-0800 5950, 2200-2300 11915, 9850. WYFR programs over VOFC: English 1302-1502 11550; Hindi 1502-1602 11550; Mandarin 1102-1602 5275, 9280; 2100-2400 6300, 2100-2300 9280, 2100-2200 9955, 2200-2400 9465, 2300-2400 11550; Russian 1505-1705 9955 (WYFR)

TURKEY State Meteorological Station from 0400 on 6900, also on 10422 USB, feeder? (Ivan Cholakov, Bulgaria, HCJB *DXPL*) V. of Turkey programs after *News, Review of Turkish Press*: Mon., *Last Week, Turkish Mosaic, Republic, Reforms, Renovation in Turkey*. Tue., *Atatuerk, Turkish Album*. Wed., *Letter Box, The Great Adventure*. Thu. *The Hittites, What's Up in Turkey?* Fri., *Turkish Instruments, Countries and Turkologists*. Sat., *Outlook, DX/Economic Panorama, Anatolia Step by Step*. Sun., *Another Spot in Turkey, Blue Voyage*. As usual, frequency schedule shown effective Sept. 6 to Nov. 1, ignoring their usual one-hour time shift around Sept. 27 due to end of DST, which we here assume: Europe 2100-2200 9445, 2300-2400 11895. Mideast, 2300-2400 7185. SW Asia, 1330-1400 9675. NE America, 2300-2400 and 0400-0500 9445.

UKRAINE Program for fishermen airs Mondays 0600 from Simferopol' on 17600, best on 11630 (Ivan Cholakov, Bulgaria, HCJB *DXPL*) One hour later now? English at 0000 on new 11250 and many others (B. Alexander, PA, *W.O.R.*)

USA Besides ham nets on 14325, 14300, 14275, 14268, etc.; and WWL, clear channel 870; we could monitor Hurricane Andrew approach and aftermath on SWBC, thanks to Jeff White who kept R. Miami International on the air with battery power, uninterrupted phone connection to very remote transmitter at WRNO, New Orleans. He filled *Miami Live* breaks between Cuban exile programs around 0030-0100, 0145-0200 weekdays on 7355 with Spanish and English updates on the situation, relays of Y-100 simulcasting WTVJ, ch. 4. WRNO lost only a few hours of airtime when winds were highest there. RMI's own transmitter undamaged, still in storage. WYFR seemingly unaffected. RMI also handles Cuban American National Foundation program via WHRI on jammed 9495; this appeared at 0210 on 12160 instead of 7315, but very degraded audio via phone. Then RMI changed its weekday sked to 0200-0300 on 7355, 0300-0500 on 7395 (*World of Radio*) WSB 750 Atlanta relayed Miami sister station WIOD during hurricane (Mike Schulsinger, OH)

WFLA, Tampa, expects worldwide coverage during favorable conditions on 25870 NBFM with its 24-hour cuing system via Motorola repeater transmitter using 75 watts or less, 5/8 wavelength whip, groundplane, 20' above ground (Alan Roberts, PQ, *W.O.R.* and *DXLD*)

WJCR's second transmitter from Kentucky started on 7460, then switched to 7464, 7465 (Tim Gueguen, Sask., John Norfolk, OK) Because Nellis AFB asserted non-interference provision on 7460 (Bob Weller, FCC) WJCR plans 13595 and 17525 next (George McClintock, TN) Heard on Sunday evening with Bro. Lester Roloff, dead a decade (Fred Waterer, *DX Ontario*) *First Alternative* is a scientology-sponsored program now on WWCR, opposing psychiatry (Tim Gueguen, Sask.) 0600-0700 Wed. to Sun.; also new is *The Hour of the Time*, Mon. 0500-0600 on 7435, which began by reading the Constitution (Adam Lock, WWCR)

KJES, New Mexico, was absent in August from 9510 after a lightning strike burning out at least the coaxial feedline (*W.O.R.*) Finally returned Sept. 2, also with new morning broadcast until 1600 on 11715, but gone again until Labor Day; English at 1400, co-channel VOA (*W.O.R.*)

Typical of former HCJB transmitters, KVOH, Los Angeles, 17775 put S9 spur on 17800, still equal level with VOA after it opened at 1800 (gh, OK)

World of Radio, your columnist's weekly half hour via WWCR and WRNO: Friday 2115 on 15690, Saturday 2200 on 15420, UTC Sunday 0200 on 7355, 0305 on 7435, 2030 on 15420, 2200 (temporary?) on 15690, Monday 2045 on 15690, Tuesday 0630 on 7435; besides possible permanent changes, all these shift one UTC hour later Oct. 25. See also COSTA RICA

Monitoradio producer Ken Bader and host Dale Willman were put on paid leave after refusing to air an apology for a report on AIDS prevention which mentioned cucumbers and condoms, after many CS church members objected (L.A. *Times* via Dennis Gibson) The church censored TV news (John Hart, former Monitor TV anchor, Sept. *Columbia Journalism Review*)

CSMWS *Letterbox* host John Parret announces he is leaving; will miss him (David Coursey, TX) Weekend *Herald* religious programs have added many languages: English, French, German, Spanish, Portuguese, Russian, Czech, Norwegian, Danish, Dutch, Swedish, Italian, Greek, Indonesian, Chinese (BBCM) Some are weekly or twice a month, very complex schedule (*ADXN*) Surprised they took so long to do this, as the newspaper long had multi-lingual column.

Bill Clinton supports creation of a Radio Free Asia (Clinton ad in N.Y. *Times* via Bill Westenhaver) VOA unable to get Bush to commit against RFA. He knows outraging California Asian-Americans could cost him a lot more than alienating old pals in Beijing (Evans & Novak in N.Y. *Post* via Bob Colyard)

VANUATU R. Vanuatu on 3945 from sign-on 1855 until 1905 fade, and 7260 from 0625 to abrupt closing 0700 (David Norcross, Guam)

VIETNAM (non) Primary name of private clandestine from Moscow, V. of Freedom, is Radio Irina, for Irina Zisman, the former R. Moscow announcer who speaks and operates it. Hanoi threatened to expel Russians from Cam Ranh Bay naval base if it's not stopped. Believed funded by Restoration Party under chairman Tran Quoc Bao. In Vietnamese, *Tieng Noi Tu Do* (BBCM) See last month

Until the next, 73 de Glenn!

Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times.*
English broadcast unless otherwise noted.

0015 UTC on 15330
BULGARIA: Radio Sofia. *Cultural Scene* program emphazing the national arts. (Bob Fraser, Cohasset, MA) Radio Moscow relay heard on 15290 kHz at 0150 UTC, *The Jazz Show* with Carl Nugorev. (Robert Tucker, Savannah, GA) (Richard Jackson, Kansas City, MO)

0034 UTC on 12040
UKRAINE: Radio Ukraine Int'l. Ukraine style music to ID. Listener's letters and folk music. Station noted on 15135 kHz at 2105, with news, IDs and feature on Ukrainian film industry. Radio Yerevan's Ukrainian relay heard on 11675 kHz at 0249. Presumed Armenian language with IDs, music, and news. (Tucker, GA) (Jackson, MO)

0233 UTC on 9580
ALBANIA: Radio Tirana. News followed by Albanian press review. Feature on Kosovo's history since 1940. Station ID 0258 into Albanian folk music. (Tucker, GA) (Joey Boone, Hodge, LA)

0235 UTC on 15235
LIBYA: Voice of Great Homeland. Arabic. Good signal quality observed on parallels 15415/15435 kHz. Traditional Arabic music to international newscast. (Richard Krasna, Highland Park, NJ)

0312 UTC on 15325
JAPAN: Radio Japan. Parallel 17810 kHz fair. Closing news headlines. Station ID/frequency-meter band sked. Mx bridge to *Let's Learn Japanese* show. (Loyd Van Horn, New Orleans, LA) (Jackson, MO) (Brian Bagwell, St. Louis, MO)

0317 UTC on 9680
UNITED STATES: Voice of Free China via WYFR. No parallels noted tonight. Discussion on Taiwan's Youth Corps on leading college campus. Clubs include drama and audio visual fields. (Bagwell, MO)

0336 UTC on 7490
UNITED STATES: WJCR. Religious station with contemorary vocals. Station ID/frequency, and station phone number. Kentucky address for QSLs (Upton, KY 42784 USA) Featured music from the Cathedral Quartet. Reported parallel 15660 kHz not heard. (Van Horn, LA) (Krasna, NJ)

0410 UTC on 7510
UNITED STATES: KTBN. Discussion on genetic engineering and bio ethics with relation to the future of America's morality. (Van Horn, LA)

0418 UTC on 4976
UGANDA: Radio Uganda. Weak signal on several subsequent nights. Deep voiced male with newscast and public service announcements. Native African and pop tunes, audible past 0435. A real tough one, hopefully improving by DX season! (Frank Hillton, Charleston, SC) (GVH)

0422 UTC on 4910
ZAMBIA: ZBC-Radio One. Vernacular. Echo-effect public service announcement. Native African rhythms to highlife tunes. Program chat and mentions of Zambia. Fair signal quality. (Hillton, SC)

0435 UTC on 11550
TUNISIA: RDTV-Tunisienne. Fair signal for Arabic readings. No audible signals on parallels 12005/7475/9675/21535 kHz. "Water dripper" interference intermittenly during ID/frequency quote, pop music, and African news topics. Tune out at 0505. (GVH)

0517 UTC on 4915
GHANA: GBC-Radio One. Constant tone to 0526. Instrumental guitar tune to drum signal at 0529. National anthem, to sign-on ID. Religious tune and prayer. Male/female duo. African pops to ID and international newscast at 0600. (Jack R. Davis, Birmingham, AL) (Thomas W. Hoffman, Decatur, IL)

0518 UTC on 4815
BURKINA FASO: Radio Burkina. French. Brief tone, 0531 to 0533. Interval signal on balafon to sign-on ID. Martial national anthem, to balafon rhythm. Station ID/frequency quote to African music. Talk with signal dropping by 0545, native African drums to final fade out by 0545. (Davis, AL)

0534 UTC on 5025
BENIN: ORTB-Parakou. French. High static as male announcer duo talks. USB interference, during public service topics. African music,ID, and feature to tune-out at 0550. (Sam Wright, Biloxi, MS)

0559 UTC on 5995
MALI: RDTV du Mali. French. Guitar interval signal to 0600. Morning greeting and ID. Exceptional signal for frequency schedule, Afro pops and local interest items. Parallel 4783 weaker, no sign of 4835/7285 kHz. ID, local Mali time check to lengthy conversation. Tune out 0642 with signal slightly decreased. (Wright, MS)

0625 UTC on 4845
MAURITANIA: R. Mauritanie. Arabic. Signal tone to 0625. Mauritanian guitar interval signal at 0628. Morning prayers at 0629. Opening ID, to features introduction and Arabic music. (Hoffman, IL)

1000 UTC on 17545
ISRAEL: Kol Israel. English news and features to 1030. Audible later on 17575 kHz at 1900 with *Calling All Listeners*. (Krasna, NJ) (Bob Fraser, Cohasset, MA) Additional Kol Israel noted at 2130 on 17575 kHz/2135 on 15640 kHz. (Tucker, GA) (Jerry Williams, Tampa, FL)

1044 UTC on 3200
PAPUA NEW GUINEA: Papua Territory-Radio Central. Pidgin. Very weak signal for announcers' reading text. Additional PNGs heard include:Admiralty Islands-Radio Manus on 3315 kHz at 1046, New Britain-Radio East New Britain on 3385 kHz at 1050. Papua Territory-NBC on 4890 at 1055. The later station also logged as late at 1145 in English. Details included IDs and text on PNG's government and plans for economic reforms. (Duane Hadley, St. Petersburg, FL)

1052 UTC on 4753.5
INDONESIA: Sulawesi-Radio Republik Indo-Ujung Pandang. Indonesian. Pop and easy-listening vocals to melody interval signal at 1100. Station ID to announcer duos' newscast. Cultural type feature to gamelan style music. Station audible to 1150. Irian Jaya-Radio Republik Indo-Wamena heard with fair signal on 4866.5 kHz at 1135. Pop Indo vocals to ID and newscast at 1200. Programming audible to fade out at 1210. (GVH)

1120 UTC on 4845.10
BOLIVIA: Radio Fides. Quecha/Aymara. Text sounding like a religious sermon to 1126. Chorus hymn."Buenos dias" morning greeting, local items and Bolivian melodies. Station ID and announcer's chat. (Hadley, FL)

1800 UTC on 15265
BRAZIL: Radiobras. National news, and report on Brazil's auto industry. Great Brazilian music. (Philip Davies, S. Wales, UK)

1800 UTC on 13680
IRAQ: Radio Iraq Int'l. English/Arabic/Spanish. Parallel noted on 15210 kHz, with VOA and Radio Algiers interference. National anthem to Holy Koran. News commentary to Arabic music. Arabic service at 1955. North American service on 15340 kHz, 0100-0300 appears to be irregular. (Stephen J.Price, Conemaugh, PA) Station logged on 15340 at 0130 in Arabic. Koran at tune-in, to talk and music on 6560.16 at 0200. (Larry Van Horn, New Orleans, LA)

1858 UTC on 15325
CANADA: Radio Canada Int'l. Special broadcast to Canadian peacekeeping troops in what was Yugoslavia, produced with Canadian Forces Network. RCI news and program produced by CFN. Military news and a song sung by a Canadian peacekeeper in Vukovar, Croatia. (Tucker, GA)

1930 UTC on 7200
YUGOSLAVIA: Radio Yugoslavia. National news and commentary. Interview with a representative from United Nations. Report followed on the UN forces at the Sarajevo Airport. (Davies, UK)

2011 UTC on 13620
KUWAIT: Radio Kuwait. Program feature, *Islam—The Religion of Truth, Right and Justice*. Discussion, Arabic music to ID, news headlines. Station sign-off, ID and national anthem at 2059. (Tucker, GA) (Hadley, FL)

2120 UTC on 11880
C.I.S. (Confederation of Independent States). Radio Galaxy. English/Russian. Intereference. Music bridge to English news. Golos Rossiye tentatively ID'd on 15315 kHz at 0004. Russian news under Spanish station. Radio Galaxy also heard on 11800 kHz at 1915. (Davies, UK) (Hadley, FL)

2150 UTC on 9745
BAHRAIN: Radio Bahrain. (Tentative) Arabic. Weak signaled chat to Arabic music 2155. Program feature with musical bridge intros. Covered by HCJB at 2200. (Scott L. Martin, Omaha, NE)

2155 UTC on 26299
ARGENTINA: Radio Nacional. Two Spanish announcers with chat and sports commentary. Surprised at this testing frequency! (GVH)

2220 UTC on 12085
SYRIA: Radio Damascus. Arabic. Fair signal ID, news and features. Parallel 15095 kHz weaker. (Krasna, NJ) (Williams, FL)

2250 UTC on 6005
CANADA: CFCX. ABC news on Yugoslavia and Somalia. ID noted as, "this is CFCX shortwave, Montreal." First time I have heard this ID; usually it is CFCF or now CIQC. (Fraser, MA)

2310 UTC on 6115.8
COLOMBIA: La Voz de Llano. Spanish. Latin pops to station ID at 2315. Good signal quality. Two additional Colombian's logged. La Voz de Guaviare heard in Spanish on 6035.2 at 2340. Sports commentary to ID break, amid VOA interferences. Caracol heard on 5075 at 0420. Multiple IDs and news. (David Gasque, Orangeburg, SC)

2338 UTC on 11710
CUBA: Radio Moscow relay. Music and program on the traditions of Russian Orthodox Church's Assumption Day. Radio Havana heard on 11970 kHz at 0000. (Tucker, GA) (Martin, NE)

2358 UTC On 6300.04
EL SALVADOR: Radio Venceremos. Spanish. Monitored several afternoons. Programming included Spanish music of pops and ballads. Religious prayers, national and Central American news. Numerous station IDs with local time checks. Closing IDs/frequency quote to sign-off by 0005 daily. (GVH)

Utility World

Larry Van Horn
c/o MT, P.O. Box 98
Brasstown, NC 28902

A Visit to Canada

One of the reasons I really look forward each year to going to the *MT* convention is that I get to see some great friends. One such bunch hails from our neighbor to the north: Canada. I always look forward to seeing Robert Evans, Eric Sillick and Ian Low and sharing a banquet table with them. So in honor of these great folks and all our friends to the north, this month we feature the Canadian Armed Forces.

Canada's air, ground and naval services have been merged into one military force called the Canadian Armed Forces since 1968. You will see me refer to this organization as CANFORCE or Canadian Forces.

Before 1968, the services were all separate: The Canadian Army was permanently organized in 1871, the Royal Canadian Navy in 1910, and the Royal Canadian Air Force in 1924. Canadian military forces fought in both World War I, World War II and the Korean War. Canadian Forces also serve on various United Nations peacekeeping forces.

The chief of the defense staff commands the Canadian Armed Forces. The chief is responsible to the Minister of National Defense, a member of the Prime Minister's cabinet.

The Canadian Armed Forces has five commands:

The ***Air Command*** supervises the military forces that defend Canada from air attack. It also cooperates with United States military forces in defending North America. In addition, the Air Command provides air transportation and aircraft training for other commands in the Canadian Armed Forces.

The ***Canadian Forces Communication Command*** maintains, manages and operates strategic communications for the Canadian Armed Forces. It also serves the federal and provincial governments of Canada in emergency situations.

The ***Canadian Forces Europe***, stationed in Germany, serve as part of the forces of the North Atlantic Treaty Organization (NATO). This command consists of land and air forces.

The ***Maritime Command*** operates Naval forces on the Atlantic and Pacific coasts to defend Canada against sea attack. It also helps support NATO forces against submarine warfare. In addition, the Maritime Command controls aircraft used in naval operations.

The ***Mobile Command*** stands ready to move combat land and air forces to any part of Canada or overseas on short notice. It also trains other Canadian troops for mobile operations.

Big Mac

Probably the most visible evidence of Canadian Forces in the Utility Bands is MACS (Canadian Military Aeronautical Communications System). This service is provided for non-tactical air-ground communications and may be used for position reporting, weather information, and search and rescue.

MACS aeronautical stations have a point-to-point relay capability which is also supported for message traffic by a teletype network. Position reports and traffic destined for any location may be relayed by any MACS station.

The major MACS stations include: Lahr, Germany (VEG); Edmonton, AB, Canada (VXA); Trenton, ON, Canada (CHR); and St. John's, NF, Canada (CJX). Notice that one long-time resident on this network is missing—Halifax. The latest information I have from official Canadian sources indicates that this station is no longer on the air.

The MACS is primarily intended to handle Canadian Military Flights, but it will make its facilities available for any allied military flight. Since the United States Air Force has bases in Canada and utilizes special flight training corridors in Northern Ontario as well as other parts of the country, MACS handles a lot of traffic for the United States Air Force. US military aircraft in Canadian airspace can be heard making phone patches to such stations as Discard, Format and Raymond 21.

Table 1: MACS Weather Broadcast Schedule

Aeronautical Station Voice Callsign, Frequency/Schedule	Mode	Time of Broadcast	Remarks
Lahr Military, VEG 13231 kHz 0800-2000 5690 kHz 2000-0800	USB Voice Only	H+16	Broadcast Forecast and ActualConditions for: Lahr(EDAN), Baden-Soellingen(EDAL), Frankfurt(EDDF), Stuttgart(EDDS), Gatwick(EGKK), and Prestwick (EGPK).
Edmonton Military, VXA 15035 kHz 1200-2300 6753 kHz 2300-1200	USB Voice Only	H+20	Broadcast Actuals for: Namao(YED), Vancouver(YVR), Winnipeg(YWG), Comox(YQQ), Cold Lake(YOD), Calgary Intl(YYC). On even hours only they add: Resolute Bay(YRB), Cambridge Bay(YCB), Churchill(YYQ), Yellowknife(YZF), Whitehorse(YXY) and Thule AFB.
Trenton Military, CHR 15035 kHz 1000-0100 6753 kHz 2300-1200	USB Voice Only	H+30	Broadcast Actuals and Forecast for: Trenton (YTR), Ottawa (YOW), Toronto/L.B. Pearson Intl(YYZ), Quebec City(YQB), Bagotville(YBG), North Bay(YYB).
St. John's Military, CJX 15035 kHz 1200-2300 6753 kHz	USB Voice Only	H+40 H24	Broadcast Actuals and Forecast for: Chatham(YCH), Greenwood(YZX), Shearwater(YAW), Gander(YQX), Goose Bay(YYR). Additional actuals only are broadcast for: St.John's (YYT),Sydney(YQY), Halifax(YHZ), Yarmouth (YQI), Brunswick, ME (KNHZ), Stephenville(YJT)

Table 2: MACS Frequencies

Lahr Military	3092 4704 5595 5690 6705 9006 11209 11233 13231 13257 15031 18012
Edmonton Military	3046(D1A) 3092 4704 5718 6705 6746 *6753 8989 9006 11209 11214 11233 11265 11271 13221 13254 1325715031 *15035 17995 18012 18027
Trenton Military	3046(D1A) 3092 4704 5718 6705 6746 *6753 8989 9006 11209 11214 11233 11265 11271 13221 13257 15031*15035 17995 18012 23250
St.John's Military	3092 3151 4704 4749 4752 5718 6693(D1G) 6705 6746 *6753 9006 9010 11209 11233 13221 13254 13257 15031 *15035 17995 18012

** indicates an exclusive weather broadcast frequency that is not monitored for traffic.*

The MACS HF radio communication system provides several basic services. Facilities are available at each MACS aeronautical station to provide official phone service to any Canadian or allied air base.

Weather information and forecasts are also broadcast by these stations. Table 1 is the complete schedule and content of these broadcasts from each of the MACS stations in the network.

Search and Rescue co-ordination centers are located in Victoria, Edmonton, Trenton and Halifax. The Canadian Search and Rescue frequency is 5718 kHz.

The Table 2 is a list of Canadian MACS communication frequencies and known designators. Additions to this list and any discrete frequencies are always appreciated and welcomed.

More from Canadian Cold Country

One Canadian radio service for which I receive many requests for information is CFARS (Canadian Forces Amateur Radio Service)—the Canadian equivalent to the US military MARS system.

Like MARS, the CFAR service provides a radio link for Canadians in CANFORCE deployed away from home. Expect to hear lots of phone patches. CFARS also provides backup communications support during emergencies, as does MARS.

CFARS stations can be divided into three different types: Military stations, Coast Guard stations, and Affiliated stations.

Military stations obviously operate from military bases or vessels. CFARS callsigns associated with these stations tend to start with "CIW" followed by one or two digits for fixed military stations. Maritime Command vessels also use the "CIW" followed by four digits. Pacific vessel digits start with a "2," and Atlantic vessels start with an "8."

Robert Ing notes in the second edition of his book, *Canadian Military Radio Frequency Guide*, that some military stations previously without CFARS capability (particularly overseas) tend to add the single digit "9" to their military tactical callsign once they add CFARS capability.

Interestingly, Ing also notes that the "CHI" prefix is used by some, but not all, militia stations and "CIC" "CIP" and "CIS" are used by some, but not all, specialist military stations.

Some Canadian Coast Guard vessels carry a CFAR capability. They will be heard using the "CIW" prefix, then four digits preceded by a "9."

Affiliated CFARS stations are operated by licensed Canadian Amateur Radio Operators. These stations use the "CIW" prefix followed by three digits.

CFARS callsigns with the prefix CIW, which are assigned to land stations (those that are followed by one to three digits), always use the first digit to identify the general geographic location of the station. This coding of CFARS callsigns are related to areas in Canada as indicated below:

CIW1	Yukon and the Northwest Territories (1-3 digits)
CIW2	British Colombia (1-3 digits) & Pacific Maritime Command Vessels (4 digits)
CIW3	Alberta (1-3 digits)
CIW4	Saskatchewan (1-3 digits)
CIW5	Manitoba (1-3 digits)
CIW6	Ontario (1-3 digits)
CIW7	Quebec (1-3 digits)
CIW8	Maritime Provinces (1-3 digits) & Atlantic Maritime Command Vessels (4 digits)
CIW9	Canadian Forces Germany, Overseas & Canadian Coast Guard Vessels (4 digits)

The main operating time for CFARS activities seems to be around 1400 - 2300 UTC. There are still other times that activity will be heard on CFARS frequencies, so be sure to check them often.

Here is the latest list of CFARS frequencies and designators:

4022.0		14445.0	Charlie
6905.0		14458.5	Delta
13970.0		14461.5	
13971.0	Alpha	20957.0	Echo
14383.5		20962.0	Golf
14384.5		20969.0	
14385.0	Bravo	20970.0	Foxtrot

Many thanks to Robert Ing for some of the background material presented in this column on CFAR. I understand Robert has now published a third edition of the book I mentioned previously and, while I haven't seen a copy yet, his work is generally reliable. The new edition is available from Grove Enterprises in Brasstown.

New ARQ-S4 Frequency?

Let's move now to the southern hemisphere and another report from Robert Hall in South Africa. In March of this year, Hall logged two FAX transmissions daily at 1200 and 1225 UTC from SAAM Molodezhnaya on 18488.4 kHz USB. The signals were strong and produced good FAX copy on the printer, but since April only RTTY transmissions have been heard on this frequency (actually, 18490.2 kHz in the ICOM RTTY mode).

On the M-7000 only the ARQ-S4 mode gives a perfect tune with all the correct LED's showing, but the screen display is difficult to interpret. Robert sees lots of "XOC" and an alpha-numeric pattern with no indication of origin. The transmissions have been at the same times as the former SAAM FAX transmissions, which suggest that the signals are coming from SAAM Molodezhnaya. My question is, "Do the Russkies have ARQ-S4?" Any ideas on this from anyone?

In closing...

Well that's this month's column. Gayle and I are looking forward to meeting with those of you attending the ute forums I will be conducting this year. On Friday night is "Who's Who in the Spectrum" followed by "Professional Monitoring Techniques." I hope you'll make plans to attend this special session on equipment and procedures used by the professionals. Saturday brings the Beginner Ute forum, and Sunday will be "Monitoring the Military" and the Experts panel. I hope you will be able to attend at least one of these talks and I look forward to meeting each and everyone of you. Best of DX and see you all in 30.

Utility World

Utility Loggings

Abbreviations used in this column

AF	Air Force	INA	Iraqi News Agency
AFTN	Aeronautical Fixed Telecommunications Network	IRNA	Islamic Republic News Agency
AM	Amplitude Modulation	LSB	Lower Side Band
AMVER	Automated Mutual Assistance Vessel Rescue System	MAP	Maghreb Arab Press (Morocco)
ANSA	Agenzia Nazionale Stampa Association	MENA	Middle East News Agency
APS	Algerian Press Service	Meteo	Meteorology
ARQ-E3	Single channel ARQ data mode	MFA	Ministry of Foreign Affairs
ARQ-M2	Multiplex ARQ data system with 2 data channels	m/v	Motor Vessel
AWS	Air Weather Service	NOTAMS	Notice to Airmen
CANFORCE	Canadian Forces	Ops	Operations
Cat	Category	PIREP	Pilot Report
CG	Coast Guard	PTT	Posts & Telegraph Administration
CGC	Coast Guard Cutter	RTTY	Radioteletype
COMSTA	Communications Station	SAM	Special Air Mission
CQ	General call for any station	SANA	Syrian Arab News Agency
CW	Continuous Wave or Morse Code	SITOR-A	Simplex telex over radio, Mode A
DE	French for 'From'	SITOR-B	Simplex telex over radio, Mode B
FACSFAC	Fleet Area Control and Surveillance Facility	TANJUG	Telegrafska Agencija Nova Jugoslavia
FAX	Facsimile	Telecom	Telecommunications
FEMA	Federal Emergency Management Agency	Unid	Unidentified
FF	French Forces	US	United States
ID	Identification	USB	Upper Side Band
		USAF	United States Air Force

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

117.4 DCF37-Offenbach Meteo, Germany, with FAX charts at 0051. (Ary Boender-Hr Spkenisse, The Netherlands)

129.5 SOA212-Warsaw Meteo, Poland, with 50 baud RTTY weather at 0010. (Boender-Netherlands)

134.2 DCF54-Offenbach Meteo, Germany, with FAX charts at 1000. (Boender-Netherlands)

3235.0 RSR71-Minsk Meteo, Byelorussia, with weather charts using FAX at 2120. (Ian Mason-Scotland)

3714.0 Interpol Brussels with SITOR-A marker and scrambled messages. (Boender-Netherlands)

3855.0 DDH3-Deutsche Wetterdienst with FAX charts showing ice conditions and wave predictions at 2126. (Boender-Netherlands)

4277.0 ZLW-Wellington radio, New Zealand, with DE CW marker at 0923. (Dix-NY)

4641.0 English female 3/2-digit number station in AM at 0000 (Thur) in parallel to 5045.0. (Tom Mazanec-Maple Heights, OH)

4777.5 IMB51-Rome Meteo, Italy, with FAX charts at 2250. (Boender-Neth)

5320.0 NMN80-CG Hampton Roads, VA, working CGC Point Herron in USB at 2316. NIK-COMSTA Boston International Ice Patrol with reports in CW at 0116. USCG Group Cape May working CGC Alert in USB at 2206. (Mark Janacek-Summit, NJ)

5355.0 RND77-Moscow Meteo, Russia, with FAX charts at 2155. (Boender-Netherlands)

5417.0 Spanish female 5-digit number station in AM at 0300 (Fri). (Mazanec-OH)

5680.0 CGC Tamaroa working Group Woods Hole regarding broken down fishing vessel in USB at 0748. Outcast 303 working Goose Military in USB at 0032. (Henry Brown-E.Falmouth, MA) *This is an international search and rescue channel-Larry.*

5692.0 CG 6011 working Traverse City Air with flight ops in USB at 0335. (Brown-MA)

5696.0 F3W working COMSTA Boston in USB, was assigned frequency 3-Echo-7 at 1241. (Brown-MA)

5718.0 Rescue 55 working Trenton Military in USB at 1608 enroute search mission. (Brown-MA)

5730.0 FDC-French AF, Metz-Frascaty Air using V CW marker at 2340.(Dix-NY)

5762.0 Spanish female 5-digit number station in AM at 0600 (Sat). (Mazanec-OH)

5870.0 NAR-Navy COMSTA Key West, FL, with CW CQ marker at 0038.(Janacek-NJ)

5907.5 US Fish & Wildlife Service Refuge Headquarters in Soldotna, AK, working a field party in LSB at 1637. (Gerald R. Brookman-Kenai, AK)

6232.0 AAFR working AACK with position reports in USB at 0012. (Russ Hill-Oak Park, MI)

6496.0 CFH-CANFORCE Halifax, NS, with coded RTTY weather at 1125. (Janacek-NJ)

6693.0 CANFORCE 2438 working warship "Fraser" in USB at 0944. CANFORCE 2405 working Trenton and St. John military. Aircraft preparing to land on the warship "Preserver" in USB at 0329. (Brown-MA)

6798.0 Spanish female 5-digit number station in AM at 0500 (Fri). (Mazanec-OH)

6812.0 Andrews working SAM 26000 & 33000 for traffic in USB at 1947. (Hill-MI)

6825.0 Spanish female 5-digit number station in AM at 0300 (Wed). (Mazanec-OH)

6840.0 Spanish female 4-digit number station in AM at 0230 daily. (Mazanec-OH)

6925.0 Spanish female 5-digit number station in AM at 0400 (Fri). (Mazanec-OH)

7597.0 AJE-USAF AWS Croughton, England, with FAX icing forecast for cat 2 aircraft at 2050. (Boender-Netherlands)

7655.0 English female 3/2-digit number station in AM at 2100 Daily. (Mazanec-OH)

7846.0 Spanish female 5-digit number station in AM at 0700 (Tues). (Mazanec-OH)

7915.0 CNM23-MAP Rabat, Morocco, with Spanish RTTY news at 1816. (Mason-Scotland)

7953.0 CFW-Vancouver Telecom, BC, Canada, working radiotelephone patches with various groups in USB at 1545. (Brookman-AK)

7959.0 9BC23-IRNA Teheran, Iran, with English RTTY news parallel to 8049.0 at 2011. (Mason-Scotland)

8040.4 KMI San Francisco (Dixon) Radio, CA, with SITOR-B test tape at 0130. (Steve Garber-Ajo, AZ)

8137.0 Spanish female 5-digit number station in AM at 0500 (Wed). (Mazanec-OH)

8331.0 GYA-US Navy London, England, FAX broadcast with surface weather and wind charts at 2025. (Boender-Netherlands)

8465.0 SYN2-Israeli Mossad number station in AM at 2231. (Dix-NY)

8478.0 VIX-Australian Naval radio, Canberra, with CQ CW marker at 0824. (Dix-NY)

8534.0 WLO-Mobile Radio, AL, with SITOR-B weather broadcast at 1345. (Garber-AZ)

8542.0 PKX-Jakarta Radio, Indonesia, with CQ CW marker at 1014. (Dix-NY)

8661.0 XSQ4/7-Guangzhou Radio, China, with CQ marker at 0952. (Dix-NY)

8686.0 PKA-Sabaug Radio, Indonesia, with CQ CW marker at 1335. (Aya Kaneko-Nagoya-City, Japan) *Welcome to the column Aya, please report often-Larry.*

8691.3 XST-Quingdao Radio, China, with CQ CW marker at 1005. (Dix-NY)

8694.0 PKM-Bitung Radio, Indonesia, with CQ CW marker at 0930.(Kaneko-Jp)

8698.0 FJP8-Noumea Radio, New Caledonia, with CQ CW marker at 0947.(Dix-NY)

8771.0 Seabreeze (FACSFAC Pensacola) calling Baker Boy. Discussing "Foxtrot 1" plus other callsigns in USB at 2216. (Brown-MA)

8967.0 Reach 70031 (C-141) working Hickam Metro (Letterman) via Hickam at 0948 in USB. Reach 59398 (C-141) working Dover Metro via Thule AB, Greenland, in USB at 2342. Old Salt Center working McClellan in USB at 0244. (Brown-MA)

8984.0 CG Rescue 2122 working Miami Ops regarding ditched aerobatic aircraft off of Cape Canaveral in USB at 2025. (Brown-MA) Kodiak working CG1700 in USB at 2259. R9D Tac Y and H6Z Tac 1 working CAMSPAC San Francisco to report flight ops and position in USB at 2057. (Chris Hulse-Eugene, OR) USCG San Juan working CG1713 in USB at 0042. (Janacek-NJ)

8993.0 Reach 67949 working Hilda via MacDill phone patch in USB at 0029. (Brown-MA)

9006.0 CANFORCE 2244 working Ottawa Ops via Edmonton Military phone patch in USB at 0047. Mentioned CANFORCE 1. (Brown-MA)

9023.0 Spar 65 working Lajes with phone patch to unknown station in USB at 0300. (Brown-MA) Chalice Charlie working Guardian in USB at 1625. (Steve Gill-Garberville, CA)

9120.8 Unid station transmitting 3 l/f groups in CW at 2235. (Dix-NY) *Probably WGY-912 Mt. Weather, Berryville, VA FEMA station-Larry.*

9340.0 RCH40-Tashkent Meteo, Uzbeck, with weather FAX charts at 1930. (Boender-Netherlands)

9382.0 AOK-US Navy Rota, Spain, with FAX nogaps charts at 2020. (Boender-Netherlands)

10493.7 RFJJF-FF Port Bouet, Ivory Coast, with ARQ-E3 idler at 2257. (Mason-Scotland)

10600.0 XVN37-VNA Hanoi, Vietnam, with French RTTY news heard at 1536. (Mason-Scotland)

10601.0 Spanish female 4-digit number station in AM at 0200 (Mon). (Mazanec-OH)
10665.0 Spanish female 4-digit number station in AM at 0200 (Thur)/0400 (Fri). (Mazanec-OH)
10710.0 RKA77-Moscow Meteo, Russia, with weather FAX charts at 2045. (Boender-Netherlands)
10720.0 LRB72-Buenos Aires Meteo, Argentina, with weather FAX at 2246. (Mason-Scotland)
11080.0 YKP28-SANA Damascus, Syria, with English RTTY news at 1735. (Mason-Scotland)
11107.0 German female 5-digit number station in AM at 0015. (Ed Rausch-Cedar Grove, NJ)
11176.0 Jama 69 (Tail No.01266/C-130) working MacDill with phone patch to Hilda (AMC-Scott AFB) in USB at 0004 then one to Pope AFB Metro. (Editor-New Orleans, LA) Doom 68 (B-52G) working Mudbug Control (2BW Barskdale) via Ascension at 0151. Lugar 11 (B-52H) calling Offutt at 2200. Diamond 30 (??) calling MacDill at 2202. King 79 working Rescue Ops via Andrews AFB at 0028. MAC 29845 (sic) working Incirlik, Turkey, with PIREP at 0030. Spar 66 working Andrews with phone patch to Phantom at 0239. Hawk 90 working McClellan with phone patch to Blue Thunder Control at 0257. Teal 12 and 21 repeatedly called by Offutt at 0115. No answer. (Brown-MA) Heard military aircraft call Mainsail then into message at 1710. (Mike Muth-LaPlata, MD) Reach 04L3 working Ascension at 0153. (Mike Starr-Hadley, MI) *All comms here in USB-Larry.*
11214.0 Sentry 67 calling Raymond 24 and working Edmonton Military in USB at 0049. (Brown-MA)
11243.0 Snoop 20 calling Skybird in USB at 0103. (Brown-MA)
11533.0 Spanish female number station (faint) in AM at 0200 (Mon). (Mazanec-OH)
12353.0 English female 5-digit number station in AM at 0225. (Hill-MI)
12356.0 Two males, greek language, arguing, both hot under the collar; at times both could be heard at the same time in USB at 0147. (Hill-MI)
12660.0 WLO-Mobile Radio, AL, in CW with AMVERS transmission at 2234. (Janacek-NJ)
12730.0 NMC-San Francisco with FAX satellite picture at 2041. (Garber-AZ)
12869.0 WNU54-Slidell Radio, LA, with CW CQ marker at 0350. (Garber-AZ)
13201.0 Reach 50242 working Thule Metro via Thule in USB at 1021. (Brown-MA)
13524.0 YIO72-INA Baghdad, Iraq, with RTTY English news at 1202. (Mason-Scotland)
13631.5 DEA47-Germany with V CW marker heard at 1457. (Dix-NY)
13653.0 SUA50-MENA Cairo, Egypt, with RTTY English/French news at 2050. (Mason-Scotland)
13817.1 CXR-Montevideo Naval, Chile, working Santiago Naval with RTTY RY/ID test tape at 1158. (Robert Hall- Capetown, South Africa)
14391.5 NNN0CQZ-USS Tuscaloosa (LST-1187) working NNN0KBG in USB at 1405. (Pettengill-OK)
14441.5 NNN0CNX-USS Virginia (CGN-38) on calling channel for routine phone patches at 2237 in USB. (Pettengill-OK)
14470.0 English female 5-digit number station in AM at 1311(Pettengill-OK)
14477.0 NNN0CUP-USS Nimitz (CVN-68) with phone ptach traffic to NNN0NUW-Whidbey Island, WA, in USB at 2002. (Pettengill-OK)
14926.9 RFFIC-FF Paris with ARQ-E3 traffic in French at 0745. (Hall-RSA)
14934.0 Algiers, Algeria, with RTTY English news at 1102. (Mason-Scotland)
14982.0 RBV76-Tashkent Meteo, Uzbekistan, with FAX weather chart at 1512. (Mason-Ireland)
14989.1 TNL77-AFTN Brazzaville with ARQ-M2 traffic and NOTAMS at 1130. (Hall-RSA)
15705.0 YZJ6-TANJUG Belgrade with French RTTY news at 1219. (Hall-RSA)
16135.0 KVM70-Honolulu, HI, with FAX test chart at 2340. (Garber-AZ)
16324.0 OVG-Frederikshavn Naval, Denmark, with V CW marker at 1300. (Pettengill-OK)
16528.0 WGWC-Tanker Omi Wabash working KHT with phone patch to Omi Corp in New York in USB at 1944. (Hill-MI)
16807.0 9VG82-Singapore with SITOR-B traffic list at 0730. (Hall-RSA)
16916.0 XSG-Shanghai Radio, China, with CQ CW marker at 0045. (Dix-NY)
16933.2 WCC-Chatham Radio, MA, with CW CQ AMVER marker at 1855. (Garber-AZ)
16969.0 WLO-Mobile Radio, AL, with CW CQ AMVER marker at 1955. (Garber-AZ)
16971.0 JJC-Tokyo Radio, Japan, with FAX printout in Japanese at 1643. (Mason-Scotland)
16997.6 WLO-Mobile Radio, AL, with SITOR-B traffic and weather at 1845. (Garner-AZ)
17062.0 PPO-Olinda Radio, Brazil, with V CW marker at 2006. (Boender-Netherlands)
17075.5 XFF2-Pajaritos Radio, Mexico, with CQ CW marker at 1834. (Dix-NY)
17175.2 A9M-Bahrain Radio, Bahrain, with DE CW marker at 2037. (Dix-NY)
17191.0 LSA-Boca Radio, Argentina, with V CW marker at 2200. (Janacek-NJ)
17239.7 SPB-Szczecin Radio, Poland, with DE CW marker at 2243. (Dix-NY)
17975.0 Pyote 68 calling McClellan in USB at 0122. (Brown-MA)
18108.4 SUU9-Cairo Meteo, Egypt, with RTTY weather messages at 1346. (Hall-RSA)
18217.7 LUMB-PTT Lumumbasha, Zaire, with SITOR-A ID at 1220. (Hall-RSA)
18220.0 JMH5-Tokyo Meteo, Japan, with FAX weather charts at 1615. (Pettengill-OK)
18270.5 HBD20-MFA Berne, Switzerland, with RTTY presse news in French and German at 1225. (Hall-RSA)
18280.5 LOR-Puerto Belgrano Naval, Argentina, with ID and 5-letter groups using RTTY at 1230. (Hall-RSA)
18296.4 Unid station with perfect tune to ARQ-S5, with the letter K dominant at 1240. (Hall-RSA)
18710.3 RIZ59-Tashkent, Uzbeck, with FAX weather chart at 1330. (Hall-RSA)
19223.3 Unid station sending RTTY RY test tape at 0245. (Greg Gilbert-Marietta, GA) *This is probably CLP1-Minrex Havana, Cuba, Greg-Larry.*
19529.5 JMG5-Tokyo Meteo with RTTY weather codes at 1540. (Hall-RSA)
19592.0 IED21-ANSA Rome, Italy, with Italian RTTY news at 1117. (Hall-RSA)
19649.2 RCF-MFA Moscow (Kupavrna), Russia, with RTTY 5 letter groups at 1530. (Hall-RSA)
20185.0 Full duplex conversations with 19954.7 carrying the other side in USB at 2049. Thought this was NASA. (Hulse-OR) *It is Chris, they have a VFT setup here-Larry.*
20300.0 NKW-US Navy Diego Garcia with FAX charts for Middle east at 1040. (Hall-RSA)
22353.6 UZNV-Soviet ship RKTS Konstructor Koshin working Sevastopol using RTTY at 1130. (Hall-RSA)
22354.6 UBKS-Soviet ship RTMS Sokrat working Kaliningrad using RTTY at 1255. (Hall-RSA)
22355.6 UOUG-Soviet ship Primorskiy Bereg working Kaliningrad using RTTY at 1412. (Hall-RSA)
22364.6 UTIY-Soviet ship RTMS Yastrebovo working Kaliningrad using RTTY at 1415. (Hall-RSA)
22381.6 HEC25-Berne Radio, Switzerland, with channel and frequency info using SITOR-B at 1235. (Hall-RSA)
22390.5 FFT92-St. Lys Radio, France, working m/v Myrtea in SITOR-A at 1245. (Hall-RSA)
22425.5 LGG/LGW-Rogaland, Norway, with CW channel/frequency information at 1645. (Hall-RSA)
22450.0 PPO-Olinda radio, Brazil, with CQ CW marker at 1600. (Garber-AZ) Same at 1657. (Hall-RSA)
22520.8 JMHC-Tokyo Meteo with FAX weather chart, fair at 1010. (Hall-RSA)
22636.6 JCT-Chosi radio, Japan, with RTTY news in Russian dialect at 1557. (Hall-RSA)
23972.2 JMG6-Tokyo Meteo, Japan, with RTTY weather codes at 1610. (Hall-RSA)
24225.0 English female number station heard in AM at 1505. (Hall-RSA)
25013.3 MTO-Royal Naval Scotland with VFT transmission at 1245. (Hall-RSA)

This QSL comes to us courtesy of Donald Michael Choleva of Euclid, OH.

The Scanning Report

Bob Kay
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Open Season to Scanners

The first day of hunting or fishing season will attract large crowds. To catch the action in your neck-of-the-woods, check out the Scanning Report.

In many areas across the United States, the month of October marks the beginning of hunting season. Here in Pennsylvania, Small Game Season (rabbit, pheasant and squirrel), will open during the last week of October. The season lasts for approximately five weeks and is immediately followed by a two week deer season.

Last year, during the first day of deer season, nearly one million hunters invaded the woods of Pennsylvania. Throughout the day there were reports of accidental shootings, sprained ankles, broken bones and lost hunters. If your state has a regulated hunting season, the month of October will probably contain at least one key hunting event.

Scanning the opening day of hunting season can be very exciting. Your first goal will be to determine the exact dates. You can write a letter to your State Game Commission, or a more informal approach is to visit your local sporting goods store. The proprietor probably has the dates memorized and will be happy to recite them. In some states, sporting good stores are permitted to sell state hunting licenses. Included with the sale of each license is a rules and regulations pocket guide that contains a yearly schedule of hunting events. Depending on your state, the guide may be free or purchased for a few dollars.

After you've marked the hunting dates on your calendar, it's time to prepare your scanning frequencies. The wildlife enforcement frequencies for your state can be located in *Police Call*. If your state permits hunting in State Parks or National Forests, you'll need to dedicate a bank of frequencies to these interests as well.

During the entire hunting season, the local police and state police frequencies will be affected by the arrival of hunters into small, rural towns. Hotels will be filled to capacity, restaurants will be crowded, and gas station patrons may need to wait in line. The hospital, ambulance and Medevac frequencies will also be active. Some of the mishaps that you'll monitor will be broken bones, lacerations and heart attacks. Lost hunter reports usually occur about an hour or two before sunset. A search for a lost hunter can involve hundreds of volunteers and may include helicopters and rescue teams.

Road blocks are common during the first few days of a regulated hunting season. State Wildlife officers and State Police will stop all vehicles and look for illegally killed game. If there is a road block in your area, scan the local FBI frequencies as well. During a regulated hunting season, federal agents look for poachers who are killing game to sell overseas.

Although hunting ends at sunset, the scanning action can continue well into the night. During large game season (deer, bear, elk, etc.), many states will use "decoys" to capture illegal hunters. The decoys are fake replicas of big game animals. The purpose of the decoy program is capture poachers who hunt primarily at night. The area around the decoy is staked out by Wildlife Officers and State Police. When the poacher attempts to kill the animal, the officers move in to make the arrest.

Although I've placed the emphasis on the fall hunting season, the same rules apply to the spring fishing season. In the mountains of Pennsylvania during the month of April, the opening day of trout season attracts thousands of anglers to streams and lakes. Scanning the fishing season is no different than scanning hunting season. The same rules apply and many of the hunting frequencies will also be active during fishing season.

As you prepare to monitor your hunting and/or fishing season, remember that the opening day will draw the largest crowds. Hunter participation and the scanning action will begin to wind down through the second and third day. By the fourth day, the scanning action will probably have reached a low point. But don't get discouraged. Hunters and fisherman will once again invade the area during the weekends. It is a predictable cycle that will remain constant throughout the season.

Catching your share of the scanning action on opening day and throughout the season is easy. You don't need a license, and you can keep as many frequencies as your heart desires. To be successful, you'll need to do your homework and plan ahead. Happy hunting, er, scanning!

Treasure Hunt

Hurry! This is your last chance to win a frequency counter from Optoelectronics. I've got one 2600H and one model 3000.

Both models feature super sensitivity, 10 digit LCD display, 16 segment bargraph and a hold button that locks the detected frequency on display. The top-of-the-line 3000 covers frequencies from 10 Hertz to 2.4 Gigahertz. The winner of the 2600H, which covers 1 MHz to 2.4 GHz, will also receive a nicad battery pack and AC charger adapter.

The bargraph is a 16 segment display that reacts to signal strength. As the signal becomes stronger, the bargraph displays additional segments. Generally, if three segments are showing, there is a signal present that can be measured. With a little practice, the bargraph can be used to guide the user to the strongest point of the transmitted signal.

After you catch the frequency, press the hold button and the 2600H and 3000 will "freeze" the display. In the past, you only had a few seconds to memorize the captured frequency. The hold button retains the frequency in the LCD until you decide to release it.

Here are the clues:

1. What is the toll free phone number for Optoelectronics?
2. The frequency of a garage door opener can be captured with a frequency counter. True or False?
3. Provide the dates for the 1992 *MT* Convention.
4. The Uniden/Bearcat 800XLT must be modified to monitor between 870 and 890 megahertz. True or False?
5. In what year did Ronald Reagan restrict the release of federal frequency lists?

Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. Please observe the following rules: 1) FAX entries will not be accepted. 2) All entries must be mailed separately. 3) The use of postcards is encouraged.

Frequency Exchange

We begin with a visit to ***Hawaii***. As we taxi to the airline ramp, pull out your scanner radio and punch in the following frequencies:

129.000	Cargo handling ramp	155.310	Hawaii Police
154.695	Hawaii Police	155.610	Hawaii Police
154.740	Hawaii Police	155.685	Waikiki Police
154.785	Hawaii Police	155.820	Life Guards
154.830	Hawaii Police	157.150	Coast Guard Rescue Ops
154.995	Game Wardens	460.700	Aloha Airlines ramp
155.130	Pearl City Police	460.725	United Airlines ramp
155.190	Honolulu Police		

The above information was supplied and confirmed by R. Souza, of Maui, Hawaii.

Returning to the mainland, our next stop is ***Louisville, Nebraska***. Mike Dillion lives near Offutt Air Force Base, and here are his favorite frequencies:

40.170	Special Investigations	154.010	Offutt fire net
40.190	Special Investigations	163.315	Offutt civil engineering
49.700	Ordnance Disposal	163.485	Offutt security police
121.700	Offutt ground control	163.510	Offutt law enforcement
126.200	Offutt Tower	163.560	Offutt mobile controller
135.350	Offutt GCA approach	236.600	Offutt tower
138.325	Offutt pagers	275.800	Offutt ground control
140.400	Airborne control	311.000	Offutt command post
142.125	IBR network	312.000	Offutt command post secondary
143.825	NECAP alert	342.500	Pilot to metro
148.035	CC Net	348.400	Offutt tower
149.050	Offutt ramp control	372.200	Pilot to dispatch
149.235	Transportation dispatch	413.200	Offutt base operations FM net
149.500	Wing commander	413.300	Offutt snow control
150.025	Offutt motor pool	413.450	Crew alerts
150.195	Offutt Medical net		
150.285	Offutt fire and crash		

Mike's complete list also contains frequencies for Eppley Airfield, Lincoln Municipal Airport and Nebraska Air National Guard. Two landing diagrams for Lincoln Airport and Offutt AFB are included with the list. To receive the free list & diagrams, send a #10 SASE to the Frequency Exchange, Nebraska List, P.O. Box 98, Brasstown, NC 28902.

Are you ready for a boat ride? The Coast Guard Air Station in ***Traverse City, Michigan***, has confirmed the following frequencies:

156.800	Distress
156.300	Intership communications
156.600	Port operations
156.650	Bridge to bridge
157.050	Coast Guard working
157.100	Coast Guard working
157.150	Coast Guard working
157.075	Marine Environment operations
157.175	Coast Guard Auxiliary

The above frequencies were taken from a Coast Guard letter addressed to Darwin McDonald, of Madison Heights, Michigan.

If you're tired of flying and boating, let's visit ***Tucson, Arizona***. A scanner buff who has asked to be called Mr. "B", has provided the new 800 megahertz frequencies for Tucson.

856.10	856.20	857.10	858.10	859.10	860.10	861.10
862.10	863.10	864.10	865.10	857.20	858.20	859.20
860.20	861.20	862.20	863.20			

According to David Mitchell, the Radio Shack store in ***Clinton, Missouri***, has invited us to stop in and sample their frequency list.

42.32	Highway Patrol	155.475	Mutual Aid
151.07	Highway Department	155.73	Sheriff statewide
151.37	Park Systems	155.76	St. Clair Sheriff
154.28	Fire-mutual aid	155.91	Clinton Tac #2
154.34	Clinton Fire	158.190	R.E.A. electric
154.565	Wendy's order window	158.745	St. Clair Rescue

Our next stop is ***Whitesboro, New York***. Whitesboro is the home town of Fred Latus, Jr., and when Fred turns on his scanner, he listens to the following frequencies:

155.955	Mohawk Valley Community College security
461.075	Baseball Hall of Fame in Copperstown
464.200	Sangertown Square security
464.925	Riverside Mall security
453.400	Oneida Prison
453.475	Mohawk Prison
453.975	Midstate Prison
460.275	Mohawk Prison
460.225	Oneida Prison
465.225	Oneida Prison
465.275	Mohawk Prison
464.975	Utica College security

Fred's complete list includes frequencies for the New York State Police and Griffiss Air Force Base. To receive the complete list, send two dollars to the Frequency Exchange, New York List, P.O. Box 98, Brasstown, NC 28902.

If anyone in the group needs medical attention, check out Dan Fern's medical frequencies for ***Waukesha, Milwaukee.***

45.580	Flight for Life Base
123.050	Flight for Life Helicopter
154.540	Kettle Moraine Ambulance
155.235	Curtis Ambulance Service
462.675	Cross Ambulance Service
462.950	Milwaukee Co. Ambulance/hospital
462.975	Milwaukee Co. Ambulance/hospital

463.000 Hospital to Paramedics F-1
463.025 Hospital to Paramedics F-2
463.050 Hospital to Paramedics F-3
463.075 Hospital to Paramedics F-4
463.100 Hospital to Paramedics F-5
463.125 Hospital to Paramedics F-6
463.150 Hospital to Paramedics F-7
463.175 Hospital to Paramedics F-8
463.425 Bell Ambulance Service
464.450 Superior Central Ambulance Company
464.475 Paratech Ambulance Company
468.000 Paramedics to Hospital F-1
468.025 Paramedics to Hospital F-2
468.050 Paramedics to Hospital F-3
468.075 Paramedics to Hospital F-4
468.100 Paramedics to Hospital F-5
468.125 Paramedics to Hospital F-6
468.150 Paramedics to Hospital F-7
468.175 Paramedics to Hospital F-8

Don also included a few railroad frequencies. And since we've already experienced a plane and boat ride, it seemed appropriate to end this month's Frequency Exchange with a ride on the rails:

161.295 WIS Central LTD (Road)
161.520 Soo Line (Road)
160.770 Soo Line (Road)
160.890 Chicago & North Western (Road)
160.455 Chicago & North Western (Maintenance)
161.040 Chicago & North Western (Road)
160.575 Chicago & North Western (Yard)
161.430 Soo Line (Yard)
161.550 Soo Line (Yard)
160.920 Soo Line (Yard)
160.575 WIS & Southern (Road)
161.145 WIS & Southern (Road)

To invite the Frequency Exchange to your home town, simply send in a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Typewritten lists are preferred, but we'll accept handwritten lists that are neat and legible.

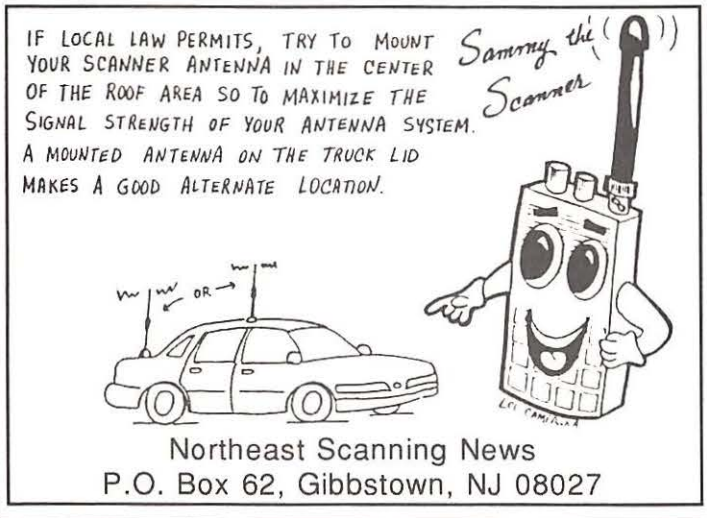
Inside Photo Radar

Regardless of the manufacturer, photo radar units share common characteristics. The main unit is a low-powered, stationary radar that operates on the K- or Ka- band. Mounted in a small van, truck or sport utility vehicle, the unit is parked along the road with the radar aimed out the back. When a vehicle exceeding the speed enters the beam, a motor-driven 35mm camera snaps a photo. Since the radar beam is narrow and short—50 feet or less—radar detectors are of little use.

A polarizing filter on the camera reduces windshield glare, and provides a clear shot of the driver's face. In states where vehicles do not display front license plates, a second camera positioned in the front of the van snaps a photo of the rear license plate. On cloudy days or at night, a powerful flash illuminates the vehicle. A red filter is placed over the flash at night to prevent blinding the violator.

Another variation of photo radar is an unattended pole mounted unit that has been tested by the Michigan State Police. Loaded with an 800 frame roll of film, the radar operates 24 hours a day. The same technology applies to "red light" cameras. The unit photographs drivers who run red lights in high accident areas. Red light cameras may also be used to monitor railroad crossings with histories of fatal accidents.

Send your photo radar information or copy of your photo radar ticket to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.



Cellular Snoops

The FBI is worried that digital cellular phones have no provisions for wiretapping. It seems that criminals can use the new digital phones with total security—free from any possible surveillance.

The Bush administration views advances in communications as a threat to the fight against drugs, terrorism, kidnappers and white collar crime, and they are seeking legislation to ban equipment that cannot be monitored.

Okay, gang—I'm scratching my head on this one. If the Bush Administration wants to monitor the airways, why don't they start by eliminating the Electronic Communications Privacy Act? As most of you already know, the ECPA has made cellular monitoring illegal.

It seems fairly simple. Eliminate the ECPA and invite scanner buffs to provide their local police with recorded cellular conversations regarding illegal activities.

Cellular Etiquette

There are about one million cellular phones in use on the streets of Japan. With so many phones in use on a daily basis, the Japanese have developed a set of cellular phone manners.

"Use of portable telephones at your seat may be a disturbance to other passengers, so please use the vestibule even if it is inconvenient," runs the message that greets riders aboard Japan's bullet trains.

In many of Tokyo's restaurants, diners are firmly asked to leave their tables to conduct urgent phone business. And although cellular phone owners pay from $700 to $1,500 up front and $100 dollars a month for the privilege of carrying a cellular phone, nearly everyone has been observing etiquette. Which is more than I can say for American users. By the way, have you been annoyed by someone using a portable cellular phone? If so, drop a short note to the Scanning Report, P.O. Box 98, Brasstown, N.C. 28902.

Smile, You're in MT

Here's an excellent opportunity to feature your listening post in the pages of *MT*. Your monitoring shack will be seen around the world by thousands of fellow scanner buffs. Photographs should be good quality, 35mm color prints. And don't be bashful—put yourself in the picture!

Be sure to personalize your entry with a brief statement about your background and other interesting information. For example: How did you get involved in scanning? How old were you when you started to scan? What was the most exciting radio transmission that you monitored?

Send your photos to the Scanning Report Reader Profile, P.O. Box 98, Brasstown, NC 28902. Sorry, photos cannot be returned.

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Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHZ.* Features include: Scan delay, memory backup, key pad lock, sidelit liquic crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16"Wx1-3/8"Dx7-1/2" high. (Optional extended 2 yr. warranty $29.99, 3 yr. extended warranty $39.99.)
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BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BC310A	85.99	(7.00)
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BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(8.00)
BEARCAT BC855XLT	186.99	(8.00)
BEARCAT BC950XLT	249.99	(7.00)
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RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

$339.99

(Plus ($9.00 Shipping Each)

16 cnannel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2¾"Hx6½"Wx10¾"D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, ¼ wave body mount antenna, mobile mounting bracket and mobile power cord all for the low price of $339.99

UNIDEN BEARCAT BC-400XLT

$99.99

($7.00 shipping)

Our best selling mobile scanner. 16 channel, AC/DC, programmable, digital. AC/DC cords, telescopic antenna, mobile mounting bracket, weather search, priority. 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jack.

BEARCAT BC-100XLT

100 Channel Digital Programmable Hand-Held Scanner

$159.99

($7.00 shipping)

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A

SHORT WAVE RECEIVER

$168.99

($7.00 shipping)

AM/FM/LW and 12 shortwave bands plus FM stereo. BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

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16 CHANNEL BASE SCANNER

$99.99 *($7.00 Shipping)*

Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

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Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructrions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.
(Optional mobile cigarette lighter cord #901MPC **$4.99**)

UNIDEN BEARCAT BC 800XLT

DIGITAL BASE SCANNER

$249.99 *($8.00 Shipping)*

Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous). 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9¼D x 4½"H x 12½"W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

UNIDEN BEARCAT BC-950 XLT

$249.99 *($7.00 shipping)*

Digital Programmable 100 Channel Scanner

BC-950 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircaft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $34.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #950 MPC $4.99.

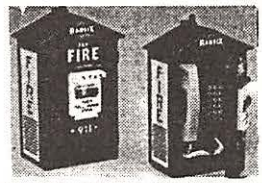
UNIDEN MR 8100

SPECIAL SALE PRICE ONLY **$289.99** *($10.00 Shipping Each)*

100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR 8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage: 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.9"W x 5.8"H x 1.9"D. Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning; 10 banks of 10 channels in any combination.

MODEL: FB-911 ORIGINAL FIRE BOX PHONE

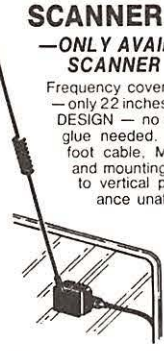
$54.99 *($5.50 Shipping Each)*



13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/ wall mount, front door closes for authentic fire box appearance, FCC approved. Size: 16"Hx8½"Wx7"D.

GM-1A™ GLASS MOUNT SCANNER ANTENNA

—ONLY AVAILABLE FROM SCANNER WORLD—



Frequency coverage 25-1200 MHz — only 22 inches tall. NEW REVISED DESIGN — no holes to drill — no glue needed. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.

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Includes mounting kit and cable. Low Band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector

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GEnie T.AREY1

"That's nice Dear."

As you are reading these words we are probably in the midst of the Monitoring Times Convention. Those of you that are here in Atlanta, be sure to stop by the Beginner's Forums and say hello. To the rest of you, you are missed and we will be looking for you next year.

I think the thing that I enjoy most about going to radio people get-togethers is the chance to meet folks of all ages who love the monitoring hobby. I especially get a kick out of meeting folks who have been involved with listening over a span of generations. Conventions bring out folks that go back to the days when tube technology was young. Just think of the exciting things to come in the future of today's young beginners who started out in the days of integrated circuits.

Okay, Uncle Skip, you're psyched. Where's the column?

I was trying to think of a subject that spans the life experiences of all radio monitors and connects beginners with old timers.

Well, if it was a snake it would have bit me! No matter how long you have been in the hobby, no matter what type of listening turns you on — SWL, ute, scanners, medium or long wave— each and every one of us has had this experience or some variation on the theme.

You're sitting at your listening post during a normal night of DXing, casually spinning the dials. The noise level is low and all is right with the world.

Then something happens... All of a sudden, an extremely rare station is heard—you know, one of those contacts most "expert" DXers can only tell fibs about hearing. Your tape recorder is rolling and you have a dead solid copy ID and more than enough program information to make a good QSL report. You cannot be denied! You have the tape to back up the logging. Your name will be legend throughout the pages of your club publication. The editors at *Monitoring Times* will write WOW!!! next to your name. You have every reason to be proud.

Then something else happens... You run out of your radio sanctorium to tell your mother, father, spouse, significant other, child, neighbor or perfect stranger of this peak DX experience. This event which will come to define you and your relation to the hobby. Then this important person in your life utters words guaranteed to take the wind out of the sails of the most dedicated DXer. Did you ever notice that they NEVER look you in the eye when they say... "That's nice, Dear"?

THAT'S NICE DEAR? You have just set the radio monitoring world on its ear and all they can say is THAT'S NICE DEAR!

Face it folks, no matter if you are a beginner or an old hand, our excitement and enthusiasm for radio monitoring is often misunderstood by those closest to us. Unless you married someone bitten by the DX bug or spawned children that can be pried away from the Nintendo game, your pursuit of radio monitoring will go largely unnoticed by those around you.

What's the Point, Uncle Skip?

The point is that it does not need to be that way. Listening to the internal service of Radio Freedonia (in Freedonian) may not get our family and friends to look away from The Home Shopping Club, but there are things on the radio that could get their attention. A quick perusal of ongoing radio programming is sure to turn up a few tidbits of information that those normally uninterested friends and family could find useful or entertaining. To that end, therefore, Uncle Skip's Monitoring Station and Bathroom Remodeling Service brings you...

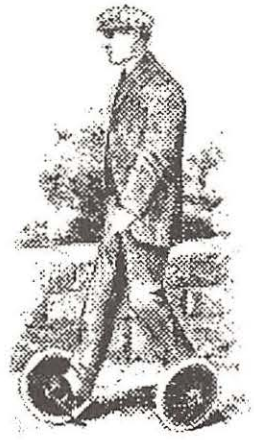
UNCLE SKIP'S GUIDE TO "TURN YOUR HEAD" LISTENING FOR NON-LISTENERS

It makes no difference what flavor of radio monitoring turns *you* on; you should be able to turn up a few subjects that could interest folks you hold near and dear. The key is to think about the kind of information people normally seek from television and local radio. News, weather, time, current events and local interest subjects can all be used by a radio monitor to get a rise out of the relatives.

What Can I Do About the Weather?

For starters, you can listen to it. Scanner users have a real jump on the rest of us, thanks to the NOAA (National Oceanic and Atmospheric Administration) Weather Radio Service. By listening to it on frequencies between 162.40 and 162.55 MHz, you will be able to delight those hanging on your every word with up-to-the-minute local and regional weather forecasts.

But why stop there? If your scanner covers the common military frequencies, punch up 255.4, 272.7 and 342.5 MHz and see if you can get flight weather from your local military base.



I'm on my way to the Monitoring Times Convention.

Shortwave monitors need not get their collective noses out of joint. NOAA operates a National Weather Service frequency at 7880 kHz as well. Tune it in from time to time as you are passing out of the 41 meter band.

Medium wave monitors can apply their knowledge of local and regional frequencies to dial up conditions in nearby spots to help with family trips. It may be clear and sunny at home but a quick listen to a station at the shore might indicate that it is raining. I have known several broadcast band listeners who became very adept at judging the location of nearby thunderstorms by the intensity of the static crashes on the AM band. Old Uncle Skip cannot recommend this practice because I remain quite shy of lightning and I would not want anyone turned into a crispy critter just to impress the family.

Hey, kids, what time is it?

Even the best time pieces are off by a few seconds from time to time. You can use your radio skills to keep your family clocks on the beam. Simply dial up WWV, Fort Collins, Colorado, at 2500, 5000, 10000, 15000 and 20000 kHz to give your non-radio oriented relatives up to the second accuracy.

If WWV turns out to be a bit hard to hear you can also give a listen to CHU, Ottawa, Canada, at 3330, 7335 and 14670 kHz. There are dozens of time signal frequencies but these tend to be the easiest to hear. Scanner users would do well to monitor local police, fire and EMS frequencies as they often give time checks, usually at shift changes.

Lots of News is Good News

Every month the *MT* Monitoring Team goes to great lengths to bring you "Newsline," an up to date guide to news broadcasts on the shortwave bands. Tracking breaking news stories has always been a skill that can be appreciated by non-radio monitoring types. If you are still in school, you should be able to dazzle your teachers by quoting news sources from the countries you are studying in your history, geography or social studies classes. Some SWLs even got their names in their local newspapers for tracking the recent Gulf War.

If you want to use news monitoring to get your relations excited, you may need to do a little research. For instance, maybe Aunt Leona's folks came from Germany: you could keep her amused for hours with anecdotes gleaned from news shows from "the old country."

Medium wavers can use the same technique on another plane. Let's say Aunt Emma is from the state next door: dedicated listening to local stations from her old stomping grounds might give you some topics for discussion around the dinner table.

For local news, a trip to the scanner is once again in order. Local radio and television stations have operating frequencies (usually in the 450 - 455 MHz area) where they discuss and develop local news broadcasts. You can often get the story behind the story including details left out of the "sound bites" that eventually make it to the evening news. Traffic reporters also operate in this band, usually feeding signals from their aircraft to local radio stations. Since your local FM outlet might only give a traffic report every fifteen minutes or so, would it not be better to catch the chopper on your scanner without waiting for a feed to your favorite station?

Far Out Listening

If you really want to impress the non-listeners in your neck of the woods you have to think big. Space may be the final frontier for those Star Trek types, but it is a frontier that radio monitors can dabble in at will. If you are looking for something that will get the kids away from the TV, nothing works quite as well as listening to the SPACE SHUTTLE. Now before you go reaching for your wallet to build a special shuttle tracking station, relax, take a deep breath and listen to Old Uncle Skip. WE GOT US A GIMMICK, FOLKS!

Actually, "gimmick" is an unfair word for the excellent work the folks at NASA do for radio hobbyists. Several NASA facilities have Amateur Radio stations that rebroadcast the space shuttle's audio link whenever we have a bird in orbit. W3NAN at the Goddard Space Flight Center in Greenbelt, MD, transmits on 3860 and 7185 kHz (LSB) and 14295, 21395 and 28650 kHz (USB). W5RRR at the Johnson Space Center, Houston, TX, can be heard on 3840 kHz (LSB) and 14280 kHz (USB). W6VIO at the Jet Propulsion Laboratories, Pasadena, CA, operates on 3840 kHz (LSB) and 21280 kHz (USB). So the next time a shuttle is in orbit, you can get your friends and family away from reruns of Star Trek and let them hear the real thing.

If you are a bit more adventurous and your house is under the flight path of a shuttle mission, tune in 296.8 MHz. You just might hear the crew without the help of NASA.

Sleep Baby Sleep

It may seem a silly application for a serious radio, but your scanner can be put to use as a second baby monitor receiver. Wireless baby monitors operate in the 49.83-49.85 MHz region. When Number Two Son was still crib bound I could keep one ear on him while down in my basement office. Your spouse will appreciate this additional effort at parenting on your part. Remember, this month we are not talking about great DXing. We are talking about impressing the troops.

Knowledge is Power

Many beginners get so caught up in the hunt for new stations that they don't take time to really listen to the programing of the stations they are logging. Stop and smell the signals, Compadre! Most shortwave programs are written with the express purpose of teaching you something. Go beyond the news programs and you will learn a great deal about the world around you. All this information can be imparted in positive ways to those non-monitoring folks around you, too.

Scanner folks can get a different feel for the business at hand by sitting on a frequency for a while. Try monitoring just the police and fire in one town for an evening. You begin to get a feeling for the periods of no activity punctuated by brief moments of intense stress and crisis. It is a great way to gain respect for folks in the uniformed helping professions.

Now Look What You've Started!

Don't be too surprised if your efforts to share your hobby in creative ways creates a convert or two. Even if you are a beginner, you can help someone along in the greatest hobby in the world! One of the best things you can do is to show them a few issues of *MT*.

Steve Douglass

Chasing Mantas, Pulsars and Senior Citizens

Defense Switching Network (DSN) Listings
(Formerly known as Autovon)

Altus AFB, OK	866-1110	Loring AFB, ME	920-1110
Andrews AFB, Md	981-9111	Los Angeles AFB, CA	833-1110
Arnold AFB, Tenn	340-5011	Lowry AFB, CO	926-1110
Barksdale AFB, La	781-1110	Luke AFB, AZ	853-1110
Beale AFB, CA	368-1110	MacDill AFB, Fl	968-1110
Bergstrom AFB, TX	685-1110	Malmstrom AFB, Mont	632-1110
Bolling AFB, DC	227-0101	March AFB, CA	947-1110
Brooks AFB, TX	240-1110	Mather AFB, CA	674-1110
Cannon AFB, NM	681-1110	Maxwell AFB, Ala	493-1110
Carswell AFB, TX	782-5000	Maxwell AFB, Gunter Annex, Ala	596-1110
Castle AFB, CA	347-1110	McChord AFB, WA	976-1110
Chanute AFB, Ill	495-1110	McClellan AFB, CA	633-1110
Charleston AFB, SC	673-2100	McConnell AFB, Kan	743-1110
Cheyenne Mountain AFB, CO	554-7321	McGuire AFB, NJ	440-1100
Columbus AFB, Miss	742-1110	Minot AFB, ND	453-1110
Davis-Monthan AFB, AZ	750-3900	Moody AFB, GA	460-1110
Dover AFB, Del	455-3000	Mountain Home AFB, Idaho	857-2111
Dyess AFB, TX	461-1110	Myrtle AFB, SC	748-1110
Eaker AFB, Ark	721-1110	Nellis AFB, NV	682-1110
Edwards AFB, CA	527-1110	Newark AFB, Ohio	346-2171
Eglin AFB. Fla	872-1110	Norton AFB, CA	876-1110
Eielson AFB, Alaska	377-1110	Offutt AFB, Neb	271-1110
Ellsworth AFB, SD	675-1000	Onizuka AFB, CA	752-3110
Elmendorf AFB Alaska	552-1110	Patrick AFB. Fla	854-1110
England AFB, LA	683-1110	Peterson AFB, CO	692-7011
Fairchild AFB, WA	657-1212	Plattsburgh AF 3, NY	689-5000
Falcon AFB, CO	560-1110	Pope AFB, NC	486-1110
Francis E. Warren AFB, Wyo	481-1110	Randolph AFB, TX	487-1110
George AFB, CA	353-1110	Reese AFB, TX	838-1110
Goodfellow AFB, TX	477-3231	Robins AFB, GA	468-1117
Grand Forks AFB, ND	362-1110	Scott AFB, Ill	567-1110
Griffiss AFB, NY	587-1110	Seymour Johnson AFB, NC	436-5400
Grissom AFB, ID	928-1110	Shas AFB, SC	965-1110
Hanscom AFB, Mass	478-5980	Shemya AFB, Alaska	392-3000
Hickam AFB, Hawaii	471-7110	Sheppard AFB, TX	736-1001
Hill AFB, Utah	458-1110	Tinker AFB, OK	884-1110
Holloman AFB, NM	479-6511	Travis AFB, CA	424-5000
Homestead AFB, Fla	791-0111	Tyndall AFB, Fla	523-1113
Hurlburt Field, Fla	882-1110	Vance AFB, OK	962-7110
Keesler AFB, Miss	597-1110	Vandenberg AFB, CA	734-8252
Kelly AFB, TX	945-1110	Whiteman AFB, MO	975-6123
Kirtland AFB, NM	244-0011	Williams AFB, AZ	474-1011
K.I. Sawyer AFB, Mich	742-1110	Wright-Patterson AFB, Ohio	787-1110
Lackland AFB, TX	473-1110	Wurtsmith AFB, Mich	623-1110
Langley AFB, VA	574-1110		
Laughlin AFB, TX	732-1110		
Little Rock AFB, Ark	731-1110		

In last month's Fed File we examined some of the adventures one can have in being an active federal, utility or military monitor. Since then, many of you have sent in stories on how monitoring has brought intrigue and adventure into your lives. Some of those stories we will have to tell in future issues, but many monitors agree that one of the most intriguing subjects to come across our receivers has been the secret "black" stealth aircraft that have been roaming across our skies.

It seems that many military monitors have been listening in on these strange and secret goings on. Some have become active investigative "stealth chasers" and have added greatly to the available information on the subject of stealth. This month we will try to put together some of the pieces of the puzzle, and see if they add up to a picture of these enigmatic aircraft.

TR-3A Black Manta

Although *Monitoring Times* revealed the existence of the TR-3A Black Manta tactical reconnaissance aircraft several months ago, it still remains a closely guarded secret. This triangular shaped aircraft is said to be a Northrop Aviation project based on their THAP (Tactical High Altitude Penetrator) studies of the 1980's. The TR-3A has reportedly been sighted flying near Beale AFB, California; Edwards AFB, California; on the Tonopah test range and Nellis AFB in Nevada. Other recent sightings have placed the aircraft flying near Holloman AFB, New Mexico; Barstow, California, (near a Lockheed facility) and on the Melrose bombing range near Cannon AFB, New Mexico.

It looks like the wraps will be taken off the TR-3A soon, as the present administration has hinted that it might reveal some information on certain "black" projects close to election time.

Fast Movers

In addition to the TR-3A, the evidence indicates that the Air Force is also testing (or has already operational) several aircraft capable of high-speed performance. One is rumored to be operating out of the secret Groom Lake flight test facility located on the huge Nellis AFB range complex. This is possibly the highly publicized but very secret "Aurora" project aircraft.

The Aurora project is speculated to be a methane-fueled, hypersonic, Mach 6 replacement for the retired SR-71 Blackbird. Evidence also suggests that the aircraft has been flying night training missions over Antelope Valley, California; Atlanta, Georgia; and Machrihanish, Scotland.

The hypersonic aircraft operating over California have left tell-tale evidence. USGS

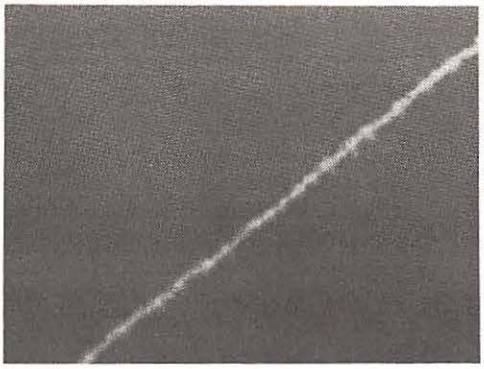


Photo of "donuts on a rope" contrail produced by "Pulser" aircraft taken over Amarillo, March 23.

seismic sensors on Catalina Island detected the sonic booms marking their passage. The sonic booms also wakened many California residents who, being a bit earthquake wary, became alarmed when their house started to shake during the early hours of the morning. On more than one occasion, the seismic sensors indicated the presence of not one but two hypersonic aircraft passing over California and towards the general direction of Groom Lake, Nevada.

Since then the "Aurora Project" aircraft has been the subject of many national and international newspaper and magazine stories. Because of this unwanted publicity, sources say that the "Aurora Project" has had its name changed to the "Senior Citizen" project—the key word being "Senior," which means that the aircraft is a USAF operation. Stealth chasers will recall that the F-1 17A was developed under the "Senior Trend" project heading.

Other secret project names that have shown up on Congressional budget documents include, *HAVE TRUMP, HAVE FLAG,* (DARPA projects), *COPPER COAST, SEEK AXEL, SEEK SPINNER, THEME CASTLE, CONSTANT PISCES CONSTANT HELP, SENIOR YEAR,* and *FOREST GREEN.*

Even Faster Movers!

Recently, an even faster aircraft with a unique propulsion method has been reported by many to be zooming over the skies of the U.S., and has even been seen by your Federal File editor. The aircraft is easily identifiable by its unique contrail that resembles a "string of pearls" or "donuts on a rope." It is theorized that the strange contrails are produced by an aircraft operating a PDWE (Pulse Detonation Wave Engine) being developed by Pratt & Whitney. This unique design can propel an aircraft or missile to extreme speeds and altitudes.

My own encounter with one of these "Pulser" aircraft happened on a bright and sunny day in March. I was talking on the phone when my windows began to shake and a deep reverberation was felt throughout the house. I quickly hung up the phone and rushed outside. Looking up to see what the source of all the racket was, I was surprised to observe a high flying aircraft leaving behind the now well-known "donuts on a rope" contrail.

I rushed inside and grabbed my camera. By the time I had returned outside, the aircraft was already disappearing over the horizon; however, the contrail still hung in the air. I took several pictures and hastily retreated to my monitoring post.

I turned up the volume of my Pro-2004 which was programmed with all known UHF military frequencies for the area. The scanner stopped on 288.000 (an AFSATCOM frequency) and digitally encrypted speech could be heard. The transmission lasted about three minutes and ended abruptly.

After developing the photos I decided to seek verification of what I had photographed by contacting *Aviation Week and Space Technology* magazine's engineering editor, Bill Scott. Mr. Scott has been following and reporting on "black" technology and is the author of a book on the subject, *The B-2 Story.* He looked at the photos and listened to my descriptions of the aircraft and the pulsing noise it generated and determined that it was most likely a PDWE aircraft.

The photos and a related story ran in the May 11th issue of *AW&ST* under the title "New Evidence Bolsters Reports of Secret High-Speed Aircraft." It seems that the photos were the first hard evidence that PDWE aircraft existed and they confirmed many rumors that the Air Force is either testing or is close to fielding an operational "Pulser" aircraft.

Since then, "Pulser" aircraft and their unique contrails have been spotted over the Great Lakes; Portland, Oregon; Alamagordo, New Mexico (White Sands Missile Range) and Denver, Colorado. Military monitors also have reported radio transmissions possibly involving these secret aircraft. If you believe you have observed one of Uncle Sam's flying wonders or have intercepted radio communications possibly involving them, don't forget to send your reports in to the Federal File!

Mailbag

Military Confusion

Several readers wrote in and said they were confused about some of the recent changes in the Air Force's structure. The new commands are Air Combat Command, Air Mobility Command and Strategic Command. Air Combat Command consists of the Air Force's conventional and tactical aircraft. Air Mobility Command is basically the same as the old Military Airlift Command, minus some of its support aircraft and tankers which are shared with ACC and Strategic Command. STRATCOM (Strategic Command) consolidates all of the Air Force's and Navy's nuclear forces—including nuclear-carrying B-52s, B-1 Bs, B-2As, intercontinental nuclear missiles and sea-going nukes.

AUTOVON/DSN

Military monitors have also asked for information on AUTOVON or DSN listings. DSN (Defense Switching Network), formerly known as AUTOVON, is the military's internal phone system linking bases and aircraft together. The difference between it and a commercial phone system is DSN's ability to handle radio-telephone traffic from airborne and mobile stations. Many monitors are familiar with the phone patches from military aircraft to command centers on the HF and UHF bands. Typically, a bomber will ask for a phone patch to a certain AUTOVON number (although it's now called DSN) through a controlling ground station.

If a military monitor has a list of AUTOVON/DSN numbers and who they are assigned to, then it is an easy task to identify the aircraft's base or the ground party in which the phone patch is placed to. So by special request, see on the opposite page a listing of some of the major bases and their AUTOVON/DSN numbers. Note: when phone patches are requested, only the first three digits of the DSN number is usually given. Sometimes the calling parties will ask for a certain extension, which is usually a command center. The numbers listed in the table are the DSN numbers for the base switch board and not the command centers.

MT

Jean Baker, KIN9DD

Everything You Always Wanted To Know About ACARS!

Have you ever been idly scanning through the VHF aero band and heard some really weird sounds on 129.125 and/or 131.550? Those, my friends, are frequencies over which the data link known as ACARS transmits. What is ACARS?

First of all, the word itself is an acronym for AirCraft Addressing and Reporting System. ACARS is used by commercial airline pilots (as well as some executive jet operations) for relaying certain types of information to their company without having to use a voice channel. Utilizing ACARS, information can be uplinked to an aircraft by company dispatch as well as downlinked by a pilot to his company operations. Unfortunately, the ACARS system is only operational on VHF. For technical reasons, it was unable to be adapted for HF use.

Now imagine monitoring the following transmission on your scanner:

"SUPERAIRWAYS FLIGHT 51 CALLING CHICAGO OPERATIONS ON 130.500."
"This is Superairways Operations, go ahead Flight 51."
"SUPERAIRWAYS 51 WAS OUT (OF THE GATE) AT ORD AT 1401 AND OFF (THE GROUND) AT 1415. WE WERE ON (THE GROUND) AT ST. LOUIS AT 1525 AND IN (THE GATE) AT 1538. OUT ST. LOUIS AT 1655, OFF AT 1700. DELAY DUE TO WAIT FOR LATE CONNECTING PASSENGERS. FUEL ON BOARD IS 28.0. ETA LAS VEGAS AT 1910."
"Roger, Flight 51: out of Ord at 1401, off at 1415; on at St. Louis at 1525 and in at 1538. Out St. Louis at 1655, off at 1700. Delay due to wait for late connecting passengers. Fuel on board is 28.0. Estimating Las Vegas at 1900. Have a good flight!"
"THAT'S AFFIRMATIVE, CHICAGO. GOOD DAY."

That transmission could be handled by ACARS compressed into only 1/3 of a second. However, as short as the transmission is, if it were sent by voice, it would chew up anywhere from 20 to 60 seconds of VHF radio time. More time may be involved if the pilot has to stand by while another flight is talking to their company on that particular frequency, or if he has to switch to another one, etc.

Voice transmissions—or "contacts" as they're called by ARINC—add up to many thousands per month. But impressive as those figures may sound, they've decreased tremendously in the last 17 or so years since the advent of the ACARS data link system.

ACARS was developed and implemented for the aviation industry by ARINC (Aeronautical Radio, Inc.) in the mid-1970's. The most obvious impact of the system on the airline carriers' air/ground communications was the reduction in voice communications—and thereby in the manpower involved in handling those transmissions.

One of the factors making this system so effective is that there are only a couple of frequencies used by the whole network to up-and-down link approximately eight million messages per month. Another factor to be considered is that ACARS is compatible both with radio equipment presently in use and that being designed for the next generation of aircraft.

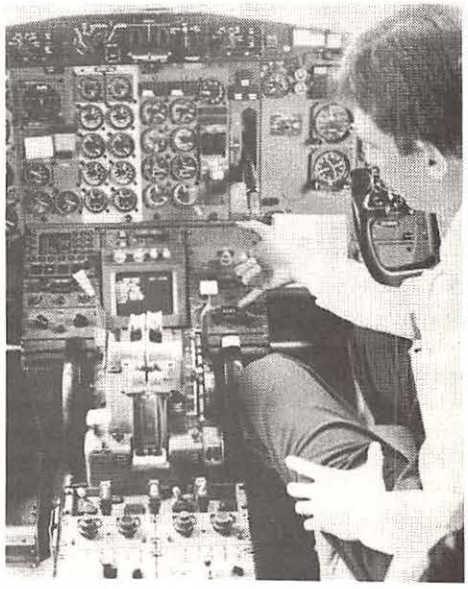
Keep in mind, however, that since there will always be a need for some voice communications in certain situations, the ACARS System will not totally replace them. It is best utilized for the passage of routine intelligence which can be gathered and downlinked automatically without need for flight deck crew intervention. This results in less saturation of the other frequencies in the 128.825-132.000 range, freeing them for voice contacts when the necessity arises.

An aircraft equipped with ACARS is rigged with sensing devices that can send data back to a ground station when the aircraft has performed certain maneuvers, such as pushing back from the gate, taking off, landing, and arriving at the gate again either at its destination or at an intermediary stop in between. These routine maneuvers are known as OOOI (pronounced 'oo-ee), because of the first letter of each maneuver involved—Out, Off, On, and In!

Simply stated, ACARS is an air/ground communications network which enables an aircraft to function as a mobile terminal connected to modern airlines command and control (C_2 in airline parlance) and management systems. The information which is collected is transmitted from the aircraft via a data link radio channel to ACARS ground radio stations. It is then relayed via the ground stations to a central computer processor where the data is converted into airline interoperable messages, through the ARINC Electronic Switching System, which is also known as the ESS.

There are 3 major elements of the ACARS Network:

1. The Airborne Subsystem, which consists of the Management and Control units.
2. The ARINC ground subsystem—consisting of the ACARS VHF Remote Networks, the ACARS Front-end Processor System (AFEPS), and the ARINC Electronic Switching System.
3. The Air Carrier C_2 (Command and Control) and Management Subsystems which include the ground-based flight operations, maintenance centers, dispatch offices, etc., of the carriers who use the ACARS system.



Simplifying the job of the crew and freeing up VHF frequencies is the object of ACARS. Photo of US Air cockpit by Harry Baughn.

On the flight deck, the Control Unit is the feature which provides interface with ACARS. It facilitates the entry of text elements of departure, ETA reports and the addresses (telephone numbers) of parties on the ground with whom the crew may desire voice communications, and other data. The display unit can be used as a scratch pad in the data entry mode and for the call-up presentation of radio frequencies, stored OOOI times, flight numbers and UTC. System status and ground-to-air voice signalling are also annunciated.

Digital display units are also utilized for receiving messages. The older-type printer units, which were in use when ACARS first appeared, are not much in evidence anymore. They had a propensity for going haywire and spewing paper all over the flight deck.

Here is a partial list of the numerous applications in which ACARS is used to transmit and receive data:

- Winds Aloft Observations (on so-equipped aircraft).
- Dispatch and Weather Update messages
- ETA (Estimated Time of Arrival) Updates
- Takeoff Thrust

- Selective Calling—For example, if SELCAL unit is inoperative, a message can be uplinked alerting the crew that they are to come up on a certain voice frequency.)
- Crew Time Information
- Fuel Status and/or Requirements
- Flight Management Computer Update messages
- Other miscellaneous Computer Base System Data

Airports which are served by airlines equipped with ACARS have a VHF station connected to the ACARS network. There is enroute coverage over the entire continental United States, as well as in San Juan, Hawaii, Canada, and Mexico.

SITA, a communications company with facilities similar to ARINC, has a version of ACARS called AIRCOM, with stations located in Europe, areas of the South Pacific, and Southeast Asia. The two systems are compatible, and aircraft equipped with ACARS can also utilize SITA.

Some of our readers, our good friend Ed Flynn, for one, have put together decoding units that can "read" ACARS messages!

That's the ACARS story in a nutshell. Unfortunately, I didn't have any photos of ACARS flight deck units that would copy well enough to be used as illustrations, but I think you've gotten the "picture" by now!

Position Reports

We've received quite a few letters from readers asking about position reports lately. We aim to please, so let's take a look at them.

When you tune into frequencies on the HF aero bands, at least 60% of the transmissions heard will concern enroute position reports. Why are position reports necessary? Well, as we've said in previous articles, Air Traffic Control cannot work flights on oceanic routes due to the limitations of radar. However, since aircraft still have to stay on predetermined, established flight paths no matter where they may be flying, operators of ground stations, such as ARINC, take reports from pilots relating to their position and other factors and in turn, relay them to ATC. One purpose of these reports is to achieve proper separation of aircraft traffic.

Position reports generally include the following information:

- Airline or military identification & flight number (tail number if it's a private aircraft)
- Present position
- Flight level
- The next two positions and estimated times
- Air Temperature
- Wind Direction and Velocity
- Ride conditions (smooth, bumpy, turbulent, etc.)
- Fuel remaining
- SELCAL letters (and sometimes request for SELCAL check)
- MACH number

Also, quite often you may hear a pilot asking the radio operator to request a different flight level from ATC, due to weather or other factors.

The ground station radio operator will read back the pilot's report and give him a SELCAL check if requested. The operator then relays the report to the proper ATC facility. When ATC receives these reports relayed by an enroute ground station, they will then know where a particular flight is in relation to other air traffic. At that time, they will either grant a pilot's request for another flight level, or deny it due to conflicting traffic.

What are those strange names you hear the pilot mentioning in his report? Those are waypoints on the route he is flying. Close to land, the waypoints are named (e.g., CHAMP, LEARS, POGGO, etc.); out to sea, latitude and longitude are utilized for positions (e.g., "over 35° North 40° West at 2100" and so forth).

If an aircraft is approaching land, the radio operator will relay to a flight an ATC transponder "squawk" to be used when the aircraft is in radar contact with an air traffic control facility.

Incidentally, I do have a complete listing of all named waypoints used in the Atlantic & Caribbean Oceanic areas. If anyone would like a copy, send a business-sized SASE to me at the Brasstown address and I'll forward one to you.

Readers Corner

• Laura Quarantiello (California) asked who and what was Lima (Peru) Radio. She had heard them working quite a few American Airlines flights on 11306 as well as 17937.

To answer your question, Laura, American Airlines bought the now defunct Eastern Airlines' South American routes several years ago, and in doing so, they also bought the services of the LDOC station that Eastern had used for many years—Lima Radio. In addition to the frequencies mentioned above, Lima also uses 8879 and 5535.

• Bill Battles (New Hampshire) tells us that MAC flights are now named "REACH" flights under the new Air Force reorganization. He also says he monitored New York ARINC one morning recently, testing what the radio operator called "Link Plus." Judging from the transmissions he heard, Bill thinks it may be a new satellite relay for HF voice comms. He said that he would let us know as soon as he heard more about this new system.

That's all for now. Next time, we'll talk about microbursts and windshear, and other aero-related subjects. Until then, 73 and out.

MT

When requesting help from MT columnists, be sure to enclose an SASE (self-addressed, stamped envelope) for their reply.

LORAN at 50

Have you ever found that perfect fishing spot only to forget its exact location on your next outing? Fortunately, there's an electronic solution to this dilemma and many other navigation woes—it's called LORAN (Long Range Radio Navigation) and all the action takes place on the longwaves.

This month marks 50 proud years of LORAN operation. The LORAN story began before World War II when the military, realizing the need for more precise navigation, began studying several possible options. the National Defense Research Committee (NDRC) was formed in 1939 with the purpose of developing a suitable system. RADAR was brand new at the time and showed great promise for short distances. However, a system was needed to satisfy the needs of long range navigation that could be used not only to plot one's position, but also to chart a course to a given destination.

The basic concept of LORAN (which is still used today) measures the small, but significant time differences in received pulses from three or more land-based transmitter sites. A LORAN receiver analyzes the data and computes the latitude, longitude, range and compass bearing of the receiving station. Accuracy of the early LORAN system was about one mile, which was very impressive in its day.

LORAN was not always at its current frequency of 100 kHz. Several frequencies, including microwave, were tested in the early days of the program. A frequency range was finally selected between 1 and 2 MHz, just above the AM broadcast band. The first two experimental stations went on the air in March 1941. They were housed at two unused lifeboat stations in Delaware and New York.

After these successful experiments, the first LORAN system (LORAN-A) was put into active service in October 1942. The Coast Guard took over full operation of the system in January 1943, and oversees its operation to this day.

Table 1. Beacon Loggings

Freq.	ID	Location	Reporter
194	TUK	Nantucket, MA	P. R. (NY)
204	GB	Buffalo, NY	M.C. (NY)
221	HM	Hamilton, ONT.	M.C. (NY)
230	BU	Columbus, OH	M.C. (NY)
254	SPK	Sparks, NV	D.T. (CA)
314	KX	Calumet, IL	C. H. (I N)
335	RWN	Winamac, IN	C.H. (IN)
338	DE	Detroit, Mi	M.C. (NY)
342	HY	Hyannis, MA	P.R. (NY)
344	AVN	Avon, NY	M.C. (NY)
359	BO	Boise, ID	D.T. (CA)
362	FMH	Falmouth, MA	P.R. (NY)
371	AZ	Kalamazoo, MI	C. H. (I N)
374	EKG	Escondido, CA	D.T. (CA)
378	CPM	Compton, CA	D.T. (CA)
382	IRS	Sturgis, MI	C.H. (IN)
391	CPB	Culver, IN	C.H. (IN)
400	RO	Rochester, NY	P.R. (NY)
411	RD	Redmond, OR	D.T. (CA)

The 1 to 2 MHz frequency range was used for many years until a series of refinements led to LORAN C in 1957. LORAN-C was put on 100 kHz because of the improved propagation stability afforded by the longwaves. In 1983, LORAN-C became the only U.S. based system, and LORAN-A was discontinued altogether.

The frequency change to 100 kHz was cause for celebration in the ham radio community. For many years, the hams had to follow a complicated list of FCC restrictions to avoid causing interference to LORAN when using 160 Meters (1.8-2.0 MHz). The restrictions included strict power limitations and "quiet hours" depending on one's location.

LORAN Today

The present-day 100 kHz LORAN operates 24 hours a day and boasts an accuracy of better than 600 feet under good conditions. You can also use the system to return to the same spot again with an accuracy of about 100 feet. Its signals are audible over most of the U.S. but are strongest near coastal areas where the transmitters are located. LORAN is also used in many other parts of the world under authority of the Coast Guard.

Once considered a luxury that few civilians could afford, a LORAN unit is now well within the reach of most recreational boaters and can be found in practically any boat store or decent marine catalog. If you want to hear what the signals sound like, just tune to 100 kHz (+/- 20 kHz) with your LF receiver. You can't miss their wideband clicking sounds if you live near any of the U.S. coasts.

Congratulations to those early inventors of LORAN and also to the U.S. Coast Guard. Happy birthday LORAN! My thanks to the *Radionavigation Bulletin* for helpful information used to compile this story.

While we're dusting off the history books, I'd like to share an interesting piece that Mike Csontos of Lima, NY, sent in. It's a vintage frequency list for all types of military craft. Mike asks for any information as to when this list may have been in effect. My best guess is the late 1920's or very early '30's, since the list refers to both spark *and* CW modes. The use of spark transmission began fading rapidly in the mid 1920's and by the '30's it was virtually obsolete, with CW becoming the mainstay. Any other guesses out there?

Transmitters will be tuned in accordance with the following tables; the number indicates the priority of each frequency for the transmitter, as compared to others on the same line.

Kilocycles	76	78	81	83	92	210	250	280	315	375	400	445	500
BATTLESHIPS													
Long Range (Arc)	1	2	5	4	3								
Intermediate Range													
Spark Motor Buzzer &TL						3	8	5	1	4	9	7	2
Type TC &TO	(Continuous)												
Type TB	(Continuous)												
Emergency (Spark)									1				2
Portable Field Sets	(As Ordered by Unit Commander)												
Auxiliary (Spark)													
Auxiliary (CW 936)													
DESTROYERS													
Tenders, Destroyer Repair Ships	1	2	5	4	3	8	13	10	6	9	14	12	7
Long Range (Arc)													
Intermediate Range													
Spark and Motor Buzzer						5	7	6	1	4	3	8	2
Short Range CW 936													1
Emergency (Spark)						3	8	5	1	4	9	7	2
FLEET BASE FORCE													
Long Range (Arc)	1	3	2	5	4	10	8	11	6	9	12	13	7
Intermediate Range													
Spark and Motor Buzzer						5	7	6	1	4	3	8	2
Short Range CW 936													3
SCOUT CRUISERS													
Long Range Arc	1	2	5	4	3								
Model "TF"						2	3	4	1	5	8	9	6
Spark and Motor Buzzer						3	8	5	1	4	6	7	9
Auxiliary													
SUBMARINES													
Submarine Tenders													
Submarine Repair Vessels													
Long Range (Arc)	1	2	5	4	3	8	13	10	6	9	12	14	7
Intermediate Range													
Spark and Model "TM"						6	7	8	1	4	9	3	2
Model "TE"	(Continuous)												
AIRCRAFT VESSELS													
Long Range (Arc)	1	2	5	4	3	9	13	10	7	6	14	11	12
Intermediate Range Spark						3	8	5	1	4	6	7	9
Tube Transmitter	(Continuous)												
AIRCRAFT													
Scouting Plane and Dirigibles						5	7	6	1	4	9	8	3
Observation Planes	As ordered by Fleet Commander												

Mailbag

• Thanks to reader Al Underwood of Silver Springs, NY, we have a mystery to share. Al has noticed a very strong carrier with no ID appearing on 197.3 kHz at various times of the day. Using his Yaesu FRG-8800 and an L-201 preamp, the signal has been heard at 30 dB over S9.

The strange thing about it is the slight warbling note heard on the carrier. It seems unlikely that this is a new beacon because of the oddball frequency being used. Beacons are virtually always on a whole frequency (i.e. 197.0, 198.0, 205.0 kHz and so on). Attempts at direction finding have placed it at roughly 45 degrees from Al's upstate NY location. If any readers wish to take a stab at what this signal may be, we welcome all guesses.

• Reader John Horton in Havana, IL, wrote to say that he's recently discovered the thrill of longwave DXing and enjoys the column very much. An avid scanner and aviation buff, John recently stumbled onto LF while using his new Sony Air-8 handheld receiver. He found that while the VHF VOR stations had very limited range, LF beacons could be heard for many miles around. He reports: "From my home in Havana, I can hear SP (382 kHz) in Springfield, AAA (329 kHz) in Lincoln, ZJY (251 kHz) in Macomb and PI (356 kHz) in Peoria—all while using the Air-8s internal antenna."

John also reported hearing ZBB (396 kHz) in Bimini, Bahamas, one odd night. Welcome aboard, John; your intercepts are always appreciated here at *MT*. This month's loggings are courtesy of the following readers: Michael Csontos (Lima, NY), Don Tomkinson (Huntington Beach, CA), Charles Hohenstein (South Bend, IN) and Paul Remington (E. Rochester, NY). See you next month!

Karl Zuk

Good Sounds In Bad Axe

Every morning at about 4 am, Jack Thomas rolls out of bed and prepares for another day acting as a human alarm clock. Jack is the morning personality and chief engineer of WLEW, Bad Axe, Michigan. Farmers and other early risers depend on his voice to begin their day, bringing the world into their homes. Just as the sun appears in the east, Jack broadcasts on 1340 AM.

WLEW serves three counties in Eastern Michigan. If you look at the state on a map it resembles an open hand. Bad Axe is the largest city in the area known as the Thumb. Thousands of acres of beautiful, flat farmlands surround this little city. You will often see a deer prance through the meadows and corn fields.

Many people are now employed in service industries that support the surrounding farms, but agrarian concerns continue to dominate. Over the years, WLEW's audience has become quite diverse.

Jack Thomas tries to create a show that everyone can enjoy. "You have to shoot broadly. Kids listen, Mom and Dad listen, and Grandma and Grandpa, too!" The morning show tradition has continued since 1950 when WLEW first signed on. Hundreds of disk jockies produce morning shows across the country, but few convey the warmth and insight into their communities that Jack Thomas does.

Jack's on-air ritual begins at six in the morning. The show begins with a newscast by Craig Routzahn. Craig's precise, low-key delivery of the latest news, sports, weather and farm prices is efficient and soothing. When Craig is done, Jack plays mellow inspirational music until 6:30 am, another WLEW tradition. The morning show continues until 9 am with program elements airing exactly according to plan.

When asked why his show is designed in precise segments, he replies "that's the way it's always been, and people expect to hear things at the same time every day. If you change the order, you'll knock everyone off schedule."

The WLEW morning show is like poetry in motion. Jack addresses his listeners like a group of old friends, which they are. "There are a lot more people listening early in the morning than you'd imagine. Go to the "Seven-Eleven" at five in the morning, and you'll see them getting coffee. There are lots of 7 am shifts here, too. You never know who's listening."

Comfortably dressed, Jack sits before his microphone as the Bad Axe town crier, sipping a cup of coffee. Birthday and anniversary announcements are essential information to his listeners. Obituaries are important, too. "The whole town will stop to hear who died."

If a school bus breaks down, Thomas can notify all of Bad Axe, and many surrounding towns, in an instant. Few homes are without his voice. Jack peppers local event announcements with a plethora of information from United Press International's computer news service and The Michigan News Network. Country music is the show's backbone, and Jack squeezes in a song when he can.

Success has come to WLEW through endless devotion to their service area. "We may be the only station nearby, but we have a lot of competition," Craig notes. "Local news is essential to our survival. We compete with all-news WWJ from Detroit and WJR. Both of them put a good signal into this area. There is an all-news station in Bay City. Local news keeps us competitive."

Routzahn dedicates his life to excellent local news coverage. Police, fire departments, and emergency support groups are queried at least four times a day, and a phone-in hot line for listeners to report breaking news keeps WLEW of the pulse of Michigan's Thumb region. Craig constantly monitors local emergency frequencies on a Regency scanner in the WLEW newsroom.

Another program drawing huge audiences is the WLEW "Ladies Line" on the air from 1 to 2 pm daily. If you are looking to sell, buy or swap something, WLEW will announce your merchandise free for all to hear. When the swapfest ends, the microphones are turned over to the public as an open forum for the rest of the hour. You'll feel like you are in the Bad Axe town square!

Commercial advertisers also realize the station's ability to deliver a message. Half a dozen sales people constantly canvass the area happily gathering accounts. With excellent management and marketing, WLEW enjoys enduring financial success.

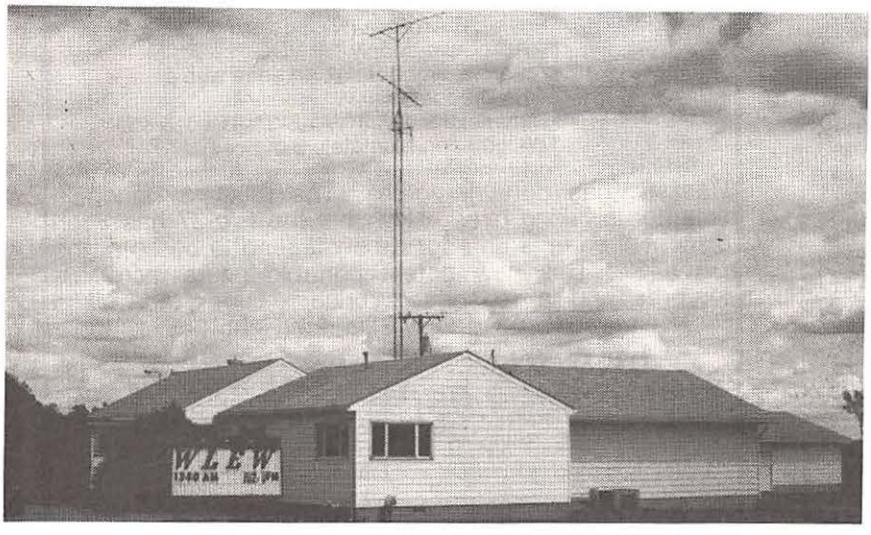
Travel around Huron County and you'll often see WLEW's remote trailer complete with a vertical VHF Yagi towering above it. A 161 MHz Marti transmitter brings the sounds of football and basketball games, local festivals, and remotes from advertiser's stores back to the studios for all to enjoy. No major event is overlooked by the WLEW Country Cruiser!

Using a state-of-the-art Harris SX-1 transmitter, WLEW broadcasts with one kilowatt during the day "with a directional pattern that sort of looks like a Girl Scout emblem," says Jack. Their signals heads north toward Lake Huron, protecting stations to the southwest and southeast. WLEW shares 1340 kHz with seven other stations in Michigan alone! At night, they drop their power to 560 watts with an omni-directional pattern. An Orban Optimod-AM audio processor keeps their sound crisp and clear.

Sister station WLEW-FM features an adult contemporary format provided on tape by Concept Productions of San Francisco, complete with announcers' voices. The announcers are recorded on a separate tape allowing local talents to substitute their patter when they like. Ear catching jingles by TM Productions give the station a slick, exciting sound.

With 50,000 watts ERP, WLEW-FM dominates the dials over an enormous area. The FM side caters to 21 to 35 year olds, using Optimod-FM processing and the range enhancing FMX system. The FM format is simulcast on WLEW-AM from 11:30 pm until Jack signs on in the morning.

When the microphones are turned over to G.A. Taggett at 9 am, Jack attends to engineering chores around the little white building on Michigan Route 53. "About six additions have been



added since the station first went on the air," Jack notes. We can only wonder how much Jack has added to lives of the people who listen to him every morning.

Be an American BandScan Reporter.
See any stories about radio in the local paper? Send them to Monitoring Times, PO Box 98, Brasstown, NC 28902.

Bits 'N' Pieces

The man who made Top 40 radio an art form has passed away. Rick Sklar honed WABC New York into the most popular radio station in North America in the 1960s and 1970s. He joined WABC as their Program Director in 1962 and developed a sound we all lived by. Sklar's team of disk jockies was unsurpassed: Harry Harrison, Ron Lundy, Chuck Leonard, Dan Ingram, "Cousin Brucie" Morrow, and "Bob-A-Loo" Lewis set the standard for America's rock 'n' roll radio. The sound was fast and exciting, sprinkled with shotgun jingles and distinctive DJ personalities. If you tuned into WABC, Sklar insured you would always hear a hit. "Musicradio 77" was the station that hundreds of stations copied, but could never duplicate.

His career with ABC continued until 1977. Sklar also served as Adjunct Professor at St. John's University and authored an autobiography: "Rocking America: How the All-Hit Radio Stations Took Over America." At the time of his death, Sklar was vice president of the Interep Radio Store, a consulting firm creating a liaison between radio stations and advertising firms. American radio would not have been the same without him.

Mailbag

American Bandscan historian and *MT* reader Michael Csontos sends in another fascinating question. Michael discovered an old letter that originated at WLW, Cincinnati, Ohio in 1934. Originally operated by The Crosley Radio Corporation as an incentive for the public to buy their radios, WLW operated with half a million watts on 700 kHz, becoming a nationwide superstation over 50 years ago. Michael wanted to know when WLW raised its power from 50 kilowatts, and how long the half-megawatt operations continued.

According to the engineering staff at WLW, the FCC granted authorization to Powel Crosley, Jr. for superpower operation on April 17, 1934. Daily broadcasts continued into 1939 when the decision was made to drop back to 50 kilowatts. During World War II, WLW would occasionally increase power back to 500,000 watts to announce submarine maneuvers in the middle of the night. It is hard to say when the last broadcast was made on WLW's big guns, but it was sometime in the mid 1940s.

New Station Grants

The *M Street Journal* directs us to the frequencies where new broadcasters will appear soon: Gualala, CA 100.5; Basalt, CO 106.1; East Lyme, CT 98.7; Tavernier, FL 96.9; Bolingbroke, GA 102.1; Greenville, GA 95.7; Seelyville, IN 95.9; Belle Plaine, IA 95.5; Decorah, IA 88.7; Danville, KY 88.1; Philpot, KY 94.7; Marlette, MI 92.5; Chester, NE 88.9; Lincoln, NE 88.5; Endwell, NY 107.5; Wrightsville Beach, NC 93.7; Benton, TN 93.1; Coalmont, TN 104.7; Austin, TX 91.7; St. George, UT 95.9; Marion, VA 103.5; Wilson Creek, WA 103.3; Yakima, WA 90.3; and La Crosse, WI 106.3.

For Sale

An unusual non-commercial AM station is being offered in North Carolina for $200,000. WLLN in Lillington operates with 5,000 watts days and 49 watts at night using a three-tower directional antenna array. All station equipment is included, along with 10 acres of real estate. If you would like to broadcast on 1370 kHz, call Dr. O. Talmade Spence at 919-892-9322.

Colorado is calling you! KRRU in Pueblo is a one kilowatt daytime AM station using 1480 kHz. It's being offered to the highest bidder over $99,000. Facilities include a directional antenna, and good terms can be provided for the right buyer. Contact G.Erway at 4211 North Elizabeth Street, Pueblo, CO 81008 for details.

International Bandscan

Broadcasting in the United Kingdom continues to expand in leaps and bounds. The Radio Authority plans to advertise licenses for five new regional FM superstations serving the areas of Central Scotland, Northeast England, Northwest England, the West Midlands, and the Severn Estuary in the near future. These new stations must offer formats that differ from the ones currently on the air, and existing station owners can only apply if they give up the licenses they hold now. Unused frequencies from 105 to 108 MHz will not be made available until 1996. Three new London AM stations are also being planned using 990, 1152 and 1458 kHz. An East London ethnic station, and additional services for Liverpool, Birmingham, Leeds, Edinburgh and Dundee will appear soon as well.

The new national network, "Classic FM," is about to begin regular operations on frequencies between 100 and 102 MHz nationwide. Their test transmissions have been quite unusual consisting mostly of bird songs, along with an occasional test tone. All eleven transmitters will use circular polarization and the RDS data/ID system. This information courtesy of the British DX Club. Well, it's time for a spot of tea, so until next month, happy trails!

MT

MT's Easy Guide to Satellite TV Monitoring

One of the less pleasant aspects of life at the end of this century is the automated receptionist. The premise is that a bank of sophisticated electronics is more efficient at routing calls than a real human being who could use a job.

I know what you're thinking: "This is starting to sound like 'Uncle Skip'!" But wait, stay with me on this. So, let's apply this concept to this month's column and see if it works any better in the printed media. Why waste your time reading through material you already know? With this special guide you can route yourself to the information you really need!

Here's how it works: If you're interested in getting started in satellite television (TVRO), go to Section #1 and read to the end of this column. If you already have a TVRO system but didn't know there was anything else to receive on it besides HBO and ESPN, go to Section #2. If you're already listening to SCPC and downloading wire services go to Section #3. Go now!

Section #1: Getting Started

As with shortwave listening, monitoring the domestic broadcast satellites can be as simple or as complicated, cheap or expensive as you like. Setting up a TVRO system is not difficult.

If you're not entirely familiar with this subject it's a good idea to start with a little reading. To find out about the wide range of information on the subject, order my *Satellite Television Sourcebook* from Grove Enterprises which includes the latest update on TVRO information. This book is about to go out of print, and a new edition is unlikely for 1993.

The single most thorough treatment of the subject is found in Mark Long's *World Satellite Almanac*. This exhaustive 1,116 page 8-1/2" x 11" format book is not cheap ($100), but you will find yourself referring to it over and over for years to come. Last month, Mark Long published the *1993 World Satellite Annual* which is a supplement to the *Almanac*. To order these or other publications write or call: MLE, Inc., P.O. Box 159, Winter Beach, FL 32971, 305-767-4687 or FAX: 305-767-6067.

Now that you've got a basic foundation on the subject, you should start looking for hardware. The best way to buy TVRO gear is via mail order. Local dealers are fine, when they're competent, but since you're doing the installation yourself you can save a lot of money by going to the mail order firms. Call the following companies for catalogs: DBS Satellite Television, 800-DBS-0046 (US) 800-327-2345 (CA); SATMAN, 800-247-4391 (US) 309-692-4140 (IL); or Skyvision, Inc., 800-543-3625 (US) 218-739-5231 (MN). These three will load your mailbox up with enough material on TVRO gear to give you a good idea of what there is, what it costs and how to install it all!

Section #2: Enjoying Your TVRO System

Just as with those who bought a shortwave radio to listen to the BBC news, many have bought satellite systems to watch cable TV fare. How surprised many viewers are when they move their dish off the main cable birds and start exploring the many facets of satellite delivered information and entertainment.

Publications

There are some 35 domestic broadcast satellites in the C and Ku bands which represents hundreds of channels of interesting viewing or listening. But you can't know where you are without a map and the best map available is called the *Satellite Channel Chart* which is published by Westsat Communications.

This 32-page publication comes out once every two months and is the most comprehensive list of every channel of every satellite in our portion of the Clarke Belt. Audio subcarriers and SCPC transmissions are all detailed. This is not the publication for the casual TVRO viewer but it is indispensable for serious enthusiasts. A one year subscription via first class mail in the U.S., Canada and Mexico is $65. International airmail subscriptions to the rest of the world are $75. California residents add $5.36 for sales tax. For a sample copy, send your request with a couple of dollars to cover postage to Westsat Communications, P.O. Box 434, Pleasanton, CA 94566 or call them at 510-846-7200.

Understanding how all the various types of transmissions are sent and received is made simple in one easily read book: *The Hidden Signals on Satellite TV* by Tom Harrington. This book offers a method of learning about audio subcarriers, SCPC, networking, teletext and much more. *Hidden Signals* is loaded with block diagrams, photos and other supporting graphics which make it easy to understand. The book is $19.95 plus $3 shipping from Universal Electronics, Inc., 4555 Groves Rd., Suite 13, Columbus, OH 43232, 800-241-8171; or from Grove Enterprises.

Periodicals

There are many books with much technical information on all aspects of satellite technology but the above suggestions are a great place to start. In addition, you should consider subscribing to a periodical or two concerning on-going developments in the industry. My favorites are *TVRO Dealer* and *Satellite Retailer*, both of which are industry trade journals which may or may not be available to the average consumer. Still it's worth looking into subscriptions.

TVRO Dealer is a monthly published by Fortune Communications, 140 South Fortuna Blvd., Fortuna, CA 95540, 707-725-1185 for $18 a year. *Satellite Retailer* is another monthly, this one from Triple D Publications, 1300 S. Dekalb St., Shelby, NC 28156 or call 704-482-9673. Subscriptions to qualified persons are $16.06 per year.

The Hardware Connection

So much for reading material. Now on to the hardware. Once you have a complete satellite system installed, you can start adding accessories which make your purchase worth even more. The first of these is an SCPC receiver.

Last month's column dealt at length with the nature of Single Channel Per Carrier transmissions in general and the SCPC-100 in particular. In addition to the SCPC-100, there is the Heil SC-1. Both are excellent choices in receiving these types of transmissions. The SCPC-100 is available from Universal Electronics, Inc., 4555 Groves Rd., Suite 13, Columbus, OH 43232 or call 614-866-1201. The Heil SC-1 is available from Heil Sound Ltd., 2 Heil Dr., Marissa, IL 62257 or call 618-295-3606.

One of the best all-time values in TVRO is the X*Press Information Service. Briefly, you get most of the world's great press services, tons of domestic news, sports from SportsTicker, National Weather Service, Knight-Ridder Financial Information and more. All you need is an InfoCipher 150OR data receiver. The receiver plugs into the data port of your IRD and interfaces with your computer. Once the supporting software is loaded and your subscription is authorized, your computer becomes a 24 hour per day news service in the home. A one year subscription is $56. For more information on this service call 800-7PC-NEWS.

The Computer Connection

There are many TVRO enthusiasts in this country who exchange information on a daily basis via various bulletin boards and home computer services. The TVRO Echo on FIDONET is one such place.

Each month, Frank Kennedy (co-moderator on the net) posts an eight page listing of TVRO related magazines, books, satellite delivered audio and video programs, and electronically based magazines. In addition, public access groups are also listed along with virtually every BBS involving TVRO in the country. If you have a computer and are interested in getting started in this hobby, this is a pretty good place to start.

Section 3: The International Factor

Satellite reception is, by the nature of the transmissions, limited to only that portion of the Earth which is covered by the "footprint" of the satellite. In the case of "spot beams," the energy of the transponder is narrowly focused and covers a relatively small area. By contrast, a "global beam" is one which covers a little more than 40 percent of the Earth in one footprint. The signal is greatly reduced from that which is spot beamed, but reception possibilities are greatly extended. That makes satellite DXing a reality. How far away can satellite reception be achieved? What equipment is needed? What can be done to increase reception?

For international reception, bigger dishes are in order (16 feet and up), circularly polarized feeds are necessary, and it's good to have the best LNB on the feed horn you can afford. It's also not a bad idea to have a PAL format TV set. All of these materials are readily available.

An excellent publication covering the international aspects of TVRO in Europe is from the UK and is called *The Transponder*. Published 24 times a year, a subscription is $75/year. Write: P.O. Box 112, Crewe Cheshire, England CW2 7DS.

Transponder Notes

• Digital Planet, the digitally transmitted multi-format satellite delivered music service, has ceased transmitting. Sluggish cable industry and failed injection of badly needed operating funds finished it off. Reportedly, the service had 3,000 retail subscribers. On a cheerier note, Digital Music Express claims to have reached the 50,000 subscriber mark after nine months. This service, which has yet to announce plans to include TVRO systems in their service, is found on F4, 19.

• A report in various trade journals says that Moscow's Independent Broadcasting Company and Turner Broadcasting system are to launch the first independent TV station in that city.

• An Indiana court has struck down an anti-dish local ordinance. Many local governments have not allowed the constitution to get in the way of their ability to infringe on the basic rights of Americans' free speech. Only the courts stand between us and the sinister collusion of government and business.

TBS' Turner and MT's Reitz meet in Atlanta. The question is: "Which is the cardboard cut-out?" You can meet Ted, too, atop the long escalator on the CNN tour when you're at the MT convention.

Fortunately for our democracy, the courts have continued to side with the individual. If your local government is impeding your access to the Clarke Belt, help is on the way. Call either the American Satellite Television Alliance (ASTA), 16 Broadway, Valhalla, NY 10595, 914-997-8192, fax 914-948-6217, or the Satellite Broadcasting and Communications Association of America (SBCA), 225 Reinekers Lane, Suite 600, Alexandria, VA 22314, 703-549-6990, fax 703-549-7640.

Both of these organizations have zoning manuals available at a reasonable cost which are designed to help you or your lawyer reach an accord with the various local powers-that-be.

• A report in *Broadcasting* magazine indicates that PBS is in the process of testing digital video compression systems built by AT&T, General Instrument (GI) and Scientific-Atlanta (S-A). One of these systems will apparently be selected and used in future satellite transmissions of PBS signals to its affiliate stations. The move to compression video is said to be timed to occur along with PBS' move to Telstar 401.

According to the *World Satellite Almanac*, PBS will have one C band and five Ku band transponders aboard T401 and will begin transmitting from this bird in July of 1993. This satellite, built by AT&T, will feature 48 channels (24 C and 24 Ku) with a power output to be controlled by ground operation depending on the use of the channel. C band channels could operate as high as 20 watts, and Ku could put out as much as 120 watts in the high power mode. The unspoken question in all this is: "Where does it leave the TVRO viewer?" It's possible that the lone C band feed will be a generic national feed to back up any possible Ku compression problems.

MT

Ike Kerschner, N3IK

Keeping it Interesting

Do you find it easy to get into an operating rut? We do the same thing over and over, like chasing DX, looking for awards or contesting, or joining the same old net time after time. No matter what it may be, doing the same thing can get quite boring.

So, if you are getting a bit jaded with hamming, it may be time to look at alternate activities. Getting into some new facet of our hobby usually requires some time in research. Fortunately, there are volumes available on almost every aspect of ham radio. (If not, then maybe you can write the volume!) Reading is the best way to learn, and all of the ham magazines have departments for the more popular endeavors. I suggest reading two books to begin with: *The ARRL Handbook* and *The ARRL Operating Manual*. If after reading these tomes you do not experience any interest in another branch of hamming, perhaps it is time to look for a new hobby.

Here are a couple of other ham radio activities that are definitely not run-of-the-mill.

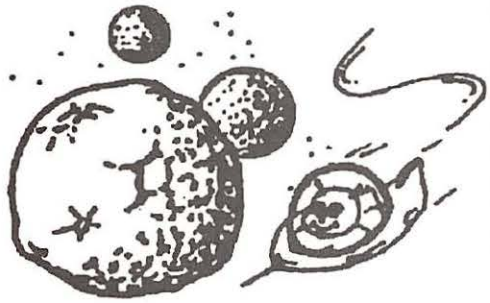
Intergalactic Information Exchange Network

"The Intergalactic Information Exchange network is a nonprofit group of ham radio operators helping to bring about a new age on the earth using ham radio to exchange all extraterrestrial communications transcribed in print, from various newsletters and magazines to audio tapes given to us regularly on donation. Our purpose is to allow shortwave listeners to learn by hearing the channeled information on tape via ham radio, and to allow other ham radio operators to join us in open discussion or contribute information they might have related to E.T. communications, close encounters, crop circles, news updates, spacecraft sighting reports etc.

"We have two net controllers who are in charge of our net—N1JVN Ken and KA1DYE Tom. We operate on the 80 meter band on frequency 3930 MHz LSB on Thursday nights from 8 pm to 11:30 pm (EDT). We need and will gladly use all E.T. communication in print or audio tape from various channelings that are taking place. We provide our service free on the ham bands as intergalactic commanders involved in communication on the planet Earth. If your spirit moves you, please send your channeled tapes, publications, and so on to: N1JVN Ken, c/o Intergalactic Informational Exchange Net, P.O. Box 617, Southbury, CT 06488.

"We also provide the same information on the CB radio channel 40 LSB from 8 pm to 11:30 pm EDT on Monday nights, which is open to all with SSB equipment."

OK, so maybe you think this is a weird idea, but it should be interesting, and who knows—it could change the way you think about such things! Certainly it would be a welcome change from the DX net you've been hanging out with on Thursdays, or from talking to good ole Homer on two meter FM for the 37 thousandth time. Try it, you might like it.



I Like this Idea!

A radio ham in Souderton, Pennsylvania, Robert Wilderman, (no call given) has started a net called PLA/NET. This net deals with our planet and the environmental problems facing it. There are three nets operating, one in the USA, another in Europe, and the third in the Pacific area. Unfortunately, the information received here did not quote frequencies or times.

Robert hopes to develop a workbook and curriculum to go with the network so schools can engage children in the experiments being conducted by members of the net. His plan is to link children in the classroom with environmental experts around the world via ham radio. This would allow our youth to learn first hand about problems of deforestation, acid rain, and ozone depletion, to name a few.

I think this idea is fantastic and I'd like to see it succeed. This is a truly creative and worthwhile use of our hobby. I have attempted to obtain more details on this net, but have come up empty handed. Should you have any information, please contact me at P.O. Box 98, Brasstown, NC 28902, so we can get the information to all of our readers and help make this effort a success.

Selective Calling

No doubt you have other hobbies besides ham radio, and would enjoy chatting with other hams with similar interests.

Over the years, various types of nets have sprung up for some special interest or another and then have died away. Nets dwindle out because most of us have lives outside ham radio, and cannot be on a net at a given time every day, week or month.

One possible solution to this problem is to have calling frequencies on the various bands. That is, if you are interested in a certain subject (say photography), simply get on frequencies popular with other photography buffs and call "CQ photo."

It would be wise to have calling frequencies on all bands from 160 to at least 2 meters. Specific frequencies might not be necessary if a band 10 or 20 kHz wide is used. After initiating a QSO, you could then move to wherever you wished. Something like this could really generate a lot of friendships and promote information exchange on other subjects besides ham radio.

There is no reason more than one interest group could not hang out on a given set of frequencies; the ham bands are wide enough to accommodate several, as long as you know where the various pastimes are grouped.

Is there any interest in this among *MT* readers? Let me know and if there is, I will put out a list of calling frequencies every so often, and we'll see if some of the ham magazines will cooperate with the effort

That's all for now. A sharp-eyed reader caught a typo from the July column: a dipole has a theoretical gain of approximately 2.2 over an isotropic source and not 1.2 as stated. Keep things interesting, gang, and we'll see ya next month with something different.

73 de Ike, N3IK

Bob Grove's Ham DX Tips

This is a dynamic month for ham DX. During the annual *CQ* World Wide DX SSB contest the 24th and 25th, you can log many rare countries and special callsigns. Look for DXpeditions to start about mid-month or earlier. An excellent way to keep up with these special operations is to check the International DX Association's information net on 14236 kHz SSB daily at 2330 UTC. These folks not only keep up with the latest DXpeditions, but pass along QSL info. In the meantime, try for these DX challenges:

BALERIC ISLANDS Stanley C. Ingram, (Box 89, Santa Eulalia del Rio, Ibiza, Baleric Islands, Spain) EA6ZY, has been found on 30 meter CW operating between 10101 and 10109 kHz Saturdays around 2230 UTC. ***EGYPT*** Mohamed (P.O. Box 1616, Alexandria, Egypt), SU2MT, is found daily between 21280 and 21285 kHz at 1800 UTC. ***GAMBIA*** Hams here were granted use of the "new" (as they are still referred to) WARC bands of 30 meters (10100-10150 kHz CW and RTTY on the high end of the band), 17 meters (18068 to 18110 kHz CW, 18100 to 18110 kHz RTTY and SSB between 18110 and 181268 kHz), and 12 meters (24890 to 24930 kHz CW, 24920 to 24930 kHz RTTY, 24930 to 24990 kHz SSB) on a trial basis using a maximum of 100 watts. So start looking for those C5 prefixed stations on those bands. ***ITALY*** Though he sailed for Spain, Christopher Columbus was born in Italy. To celebrate the 500th anniversary of Columbus' first voyage to the Western Hemisphere, The Radio Amateurs of Genova are offering "The Christophero Columbo Award." They will have special events stations IQ2CC (Milan where Columbus lived for a while) and IQ1CC (from his birthplace, Genova) every weekend during the "award period" (which started 1 September and continues through 31 December 1992). You get one point for each Italian station logged, three points if the station is located in Genova, and five points if you log one of the special events stations. Available to SWL's as well as licensed amateurs, you need the following number of points to qualify: Italians 50, elsewhere in Europe 30, the rest of the world 10 points. There is a catch, though; one of your loggings MUST be either IQ1CC or IQ2CC! To handle the costs of printing, mailing and processing the awards applications, there is a fee of either $6 US, 10 IRC's, 35 French Francs, 10 Deutsch Marks or Swiss Francs, 3.5 British Pounds, or 100 Italian Lire, whichever is easier for you to send. Mail the fee and a certified copy of your log data (it can be certified by either two licensed amateurs, a radio club official or a Notary Public) to: ARI Award Manager, Via Scarlatti 31, 20124 Milano, Italy. ***MOLDOVA*** Operating from this former Soviet Republic and now independent country is RO4OA who keeps regular schedules on 14010 kHz to 14020 kHz CW at 0030 UTC and on 14210 kHz SSB at 0330 UTC most days. Send your reports to his QSL manager: SP9HWN, Wojciech Drwal, ul Maja 29, 42-500 Bedzin, Poland. ***MOZAMBIQUE*** C9RJJ is newly assigned to the US Embassy here and on weekends offers this rare country to CW fans on 14040 kHz at 0530 UTC and SSB fans on 21270 kHz starting at 1615 UTC. His QSL manager is: W8GIO, Paul R. West, Rt. 1 Box 140-42, Bunker Hill, WV 25413. ***PERU*** It is not too often that we get a tip for a station in this country and a RTTY operation is even more rare, but OA4BOW (who is Humberto E. Catter D Aste, Calle 3A7, Los Alamos de Monterrico, Surco, Lima, Peru) has been showing at 0500 UTC on 14085 to 14090 kHz RTTY. ***ST. HELENA*** Chuck Chalmers (P.O. Box 126, St. Helena Island, South Atlantic) is ZD7CRC. Chuck provides one of the more interesting loggings on amateur radio as he will tell you about the island and himself whenever possible. ***SIERRA LEONE*** 9L1JC (QSL to Jerry Cooper, 211 Meadowlake Dr., Seguin, TX 78155 USA) is working in the US embassy here and appears on 14170 kHz SSB at 2330 UTC and 21225 kHz SSB at 1900 UTC some days. ***UNITED NATIONS HQ IN NEW YORK*** During their lunch hour (1600-1700 UTC) weekdays, when they can, employees here operate the amateur radio club station 4U1UN on RTTY 14085 to 14090 kHz or SSB around 14230 kHz SSB. On weekends, 4U1UN can be found on or near the same frequencies starting at 0200 UTC. ***UZBEK*** Another former Soviet Republic that is now an independent country. UI8ZAA (whose QSL Manager is K9FD, Mervyn D. Schweigert, Rt. 2 Box 138-A, Red Bud, IL 62278) has been offering this one on 21265 kHz SSB or 21335 kHz (in the GW3CDP DX net) starting at 1600 UTC. ***WORLD BANK*** Located in Washington, DC, and often in the news, there is an amateur radio club station, 4U1WB, that operates from here Fridays at 1330 UTC around 14185 kHz SSB +/- 5 kHz due to interference. If you log this one, send your QSL request to KK4HD, Paul J. Van Der Ellik, 4900 Bradford Dr., Annandale, VA 22003.

Hope you are able to log many new stations and countries in the contest mentioned above (the amateurs will be exchanging their signal reports as well as "CQ zones"—the world is divided into 40 such zones).

Canadian Religious Television Pirates Busted

A few prominent FCC busts of United States pirate stations have generated big news during the past year. In contrast, an anonymous Canadian *MT* reader writes in this month to note the curious fact that during the last decade, the Canadian Department of Telecommunications has **never** conducted a highly publicized bust of a hobby pirate shortwave station in Canada. This DOC inactivity has contrasted sharply with the FCC's occasional overt attacks on USA pirates.

The Department of Communications does have the capacity to close down unlicensed stations, and it has done so this year. *MT* reader Glen Pearce of Winnipeg, Manitoba, forwards a copy of a *Winnipeg Sun* article on the DOC's late May confiscation of six pirate television transmitters operated by **Life Broadcasting.** The pirate TV stations featured relays of **Trinity Broadcasting Network** religious programming.

Gerald Desroches of the DOC Ottawa office said that the TV relays had ignored written May 8 warnings to cease unlicensed broadcasting. Two silenced transmitters operated in the Winnipeg area. The other four were in Saskatchewan (Saskatoon and Shawnavon) and Alberta (Medicine Hat and Three Hills).

Ken Groaning of Life Broadcasting characterized these busts as religious persecution. However, Desroches of the DOC replied that some of the stations had been transmitting pirated **HBO** entertainment programming. Under provisions of the Canadian Radio Telecommunications Act, the stations could be fined between $5,000 and $10,000 for each day of unlicensed operation. The DOC is clearly not toothless!

Radio USA vs. FCC

We covered the war between **Radio USA** and the FCC's Laurel, Maryland, field office in *MT's* August and September issues. The struggle continues. On July 2 the FCC issued a $17,500 Notice of Monetary Forfeiture to alleged station operator Andrew R. Yoder of Chambersburg, Pennsylvania. Yoder quickly fired off a response to the FCC. He denied responsibility for Radio USA's pirate transmissions, disputed the FCC's evidence, and failed to pay the fine. Yoder contends that he is being harassed by the FCC because of his prominent position as an author and publisher in the pirate radio listening hobby.

Meanwhile, *MT* received a Press Release from host Mr. Blue Sky of Radio USA. Mr. Sky says that the station "has not been busted, caught, overrun, mutinied, devastated or man-handled by the FCC." As this month's loggings indicate, the station has been active after the Yoder incident with the FCC on 41 meter frequencies, and in the 21460-21510 kHz range of the 13 meter band. Mr. Blue Sky reports that over 900 station QSL's have been mailed to DXers in 46 states and six countries. He promises that QSL #1,000 will be a full data verie on the back of a Radio USA t-shirt.

Clandestine Activity

A large amount of big pirate news last month forced us to hold over lots of good clandestine material. Plenty of interesting items have arrived in Brasstown:

•*MT* reader Terry Provance of Zanesville, Ohio, received a nice full data QSL from the **Voice of the Broad Masses of Eritrea.** It lists an address for reports c/o Information Department, P.O. Box 872, Asmara, Eritrea, Ethiopia. The station notes that its broadcasts are produced in the local Afar Tigugna language.

• **Radio Muhabura,** the radio voice of the Rwandan Patriotic Front, has rarely been reported by North American listeners during its two year existence. However, the BBCMS found them operating during the summer on 6340 or 6400 kHz with a normal schedule of 0415-0515, 1000-1100, and 1715-1815. African propagation always improves during fall and winter months, so you may want to check this one out.

• Hans Johnson of Columbia, Maryland, looked for the Algerian relay of **La Voz de la Resistencia de Chile** on 15215 kHz at 0200. He instead found **La Voz de Chile Libre** co-channel with an Arabic program from Algeria. It is possible that this was a mixing product at the transmitter site. But, it may be that the Chilean clandestine could have a new ID and/or a new location.

• English programming is rare from Middle East clandestines, but there is one prominent exception. I regularly hear **Iran's Flag of Freedom Radio's** sign on just before 0330 on three parallel 25 meter frequencies: 15100, 15565, and 15640 kHz. They give a brief ID in English and other languages at the beginning of each broadcast. Circumstantial evidence has piled up over the years in support of a theory that the station is a CIA operation via Egyptian transmitters that is financed by your tax dollars.

• **Radio Patria Libre's** powerful anti-Colombian 15045 kHz channel has been silent lately, but many (including your columnist) still hear them regularly on 5850 kHz. Their evening schedule runs between 0030-0100.

The National Alliance

In August we analyzed the quasi-clandestine **National Vanguard Radio,** which still blasts in via a **WRNO** 7355 kHz relay on UTC Sundays at 0100. *MT's* Glenn Hauser reminds us that National Vanguard Radio originally had a sixteen week run over **WWCR's** transmitter before it moved to its current WRNO home. Both Vanguard and the long-running **Voice of Tomorrow** are associated with a fascist group called the National Alliance.

The National Alliance has emerged in a context outside shortwave radio. During the summer academic quarter, dozens of Nazi posters containing the National Alliance logo suddenly plastered the campus of Kent State University in Kent, Ohio. The KSU administration ripped them all down on the pretext that the National Alliance is not an official college organization. The situation generated widespread press coverage in northern Ohio. So, National Vanguard Radio and the West Virginia fascist bookstore that it promotes on WRNO are not the only activities of the National Alliance group.

Europirate Info Sources

Veteran *MT* reporter Martin Lester of the United Kingdom relays the unfortunate news that the excellent quarterly FRQ Database *Free Radio Directory* of Europirate station schedules and addresses has suspended publication. Martin also says that **WKNR-West and North Kent Radio** has been extremely active lately. It uses 3945 kHz at 1800-0600 beginning on UTC Saturday. On UTC Sundays it is found on 6400 kHz between 1000-1300, but it sometimes tests during these hours on 9960 kHz.

Others sources exist for current Europirate information, and *MT* reader Eric Suter of Sutherland, Virginia, forwards a copy of a good one. The *Pirate Chat* bulletin features detailed coverage of longwave, medium wave, shortwave, FM and satellite pirate stations based in Europe. A North American pirate loggings column is a nice additional touch. Sample copies are available for one pound sterling or $2 US c/o 21 Green Park, Bath, Avon, England BA1 1HZ.

Some Europirate stations distribute their own newsletters. *MT* contributor John Hollowell of Port Republic, Maryland, sends one in from Peter Hills of **Radio Waves International,** heard regularly during weekends on 7473 and 11401 kHz. They seem to have a very loose affiliation with Australian pirate **Radio G'Day,** which also uses 11401 kHz. In *Fine Tuning*, expert DXer Jerry Berg of Lexington, Massachusetts, reports that he has actually QSL'ed Radio G'Day! RWI welcomes correspondence through P.O. Box 130, 92504, Rueil, Cedex, France. *MT* reader "Frank" of Vanues, France, sends in logs of RWI and dozens of other active Europirates.

Another nice set of materials arrived in Brasstown direct from **Radio Dublin,** which has resumed shortwave activity on slightly variable

He Man says Kristin Kaye — not!

6910 kHz from a 300 watt transmitter. They can be heard on our side of the Atlantic under good conditions. Dublin says that their 25 year history certifies them as Ireland's longest running independent radio station. It uses a simple postal address of Radio Dublin Ltd., Dublin 8, Ireland. Remember, when writing to Europirates you should enclose $1.00 US for return postage.

Pirates Still There

Veteran *MT* contributor David Alpert of ABC News in New York forwards a summary of an Associated Press story about USA pirates filed over AP Network News. The story included an interview with John Young of the FCC staff, who said that a "government crackdown" had "nipped (pirate activity) in the bud" before it got "out of control" like the CB band.

The AP story featured audio clips from **WBLO** and the **Voice of Communism,** neither of which has been active during the last couple of years. Despite a small handful of high profile FCC busts and Young's remarks over AP, logs from *MT* readers this month indicate that plenty of North American pirates are still active.

Regular *MT* contributor Dave Gasque of Orangeburg, South Carolina, sends in a useful tip for pirate operators. Many DXers (including Dave) sometimes have trouble fishing pirate station identifications out of the mud because of weak signals, interference, and static. In addition, the clarity of speech by some station announcers is rather muddled by sloppy diction or sub-par transmitter modulation. Dave suggests that slow and frequent station ID's can be quite helpful under these circumstances, and that call letters spelled out phonetically can be a real plus. How about it, stations?

Maildrop addresses used by pirates reported this month include P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; 770 Sycamore Avenue, #J-193, Vista CA 92083; P.O. Box 25302, Pittsburgh, PA 15242; and P.O. Box 293, Merlin, Ontario NOP 1WO.

What We Are Hearing

I look forward to seeing many of you in Atlanta at the October *MT* convention!

Anarchy One 7415 at 0330. Captain Anarchy mixes rock music with advocacy of radical political change in the USA. Addr: Vista. (Skip Harwood, Beale AFB, CA)

CSIC- 7413 at 0200. Pirate Rambol's Canadian pirate, easily identified by its Psycho Chicken interval signal, remains quite active with rock, commentary, and relays of other pirates. Addr: Blue Ridge Summit. (Hollowell, MD)

Down East Radio- 7413 at 0200. New pirates emerge all the time; this one's initial tests featured rock music programming. Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH)

EBO Radio- 7415 at 0245. This rock music station reactived in July from the Boundary Street Country Club in Frogmore, SC, but host Uncle Billy says that they first transmitted from a Marine military base in 1974. Michael's first pirate! Addr: Wellsville. (Pat Murphy, Chesapeake, VA and Michael Sehmehl, Reading PA)

KIWI- 7415 at 1230. Actually a veteran New Zealand pirate, this one has been relayed recently in North America via **WSKY,** according to a phone call direct from Oceania! Addr: Wellsville for WSKY. (Greg Lytle, Lubbock, TX)

KNBS- 15049 at 0015. Phil Muzik's veteran pirate, the shortwave service of the California Marijuana Cooperative, has returned with its very slick productions on both 19 and 41 meters. Addr: Wellsville. (Alan Masyga, Winona, MN and Bob Confino, Douglassville, PA)

He Man Radio- Larry Gotts of Richfield, PA, received the QSL pictured this month from He Man, but Larry is puzzled by the slashed "KK" symbol. This reflects He Man's running feud with host Kristin Kaye of **WWCR's** "Signals" DX program. Addr: Blue Ridge Summit.

Radio Anarchy- 4816 at 0500. Not to be confused with either the **Voice of Anarchy** or **Anarchy One,** this one recently programmed flute music. It announces plans for continued 60 meter transmissions on frequencies like 4760 kHz. Addr: Blue Ridge Summit. (Harwood, CA)

Radio DC- 7416 at 2315. The leftist shows on this one have used the Los Angeles riots as ammunition for scathing election year criticism of George Bush. Addr: none, but still verifies log reports in *ACE*. (Masyga, MN)

Radio USA- 7413 at 0230, 7415 at 0145, etc. Despite the FCC bust discussed in three consecutive *MT* issues, Mr. Blue Sky remains active with punk rock, parody sketches and ads for station T-shirts. Addr: Wellsville. (Schmel, PA and Hollowell, MD)

RKNA- 7415 at 0230. The old geezer announcer mixes rock and cowboy music with parody ads. Although they have been widely heard, most DXers report weak signals from them. Dennis, first pirate! Addr: Wellsville. (Rev. Dennis Myhard, Dermott, AR)

Voice of "Bob"- 7414 at 0215. The Church of the Subgenius programs a professionally produced parody of fundamentalist preachers, with sermon topics like, "Did you know that Jesus smoked Chesterfields?" Addr: Wellsville. (Mark Seiden, FL; Confino, PA)

Voice of the Night- 7415 at 0330. Lad's foolish irresponsibility continues; he intentionally jammed every ID announcement on a midsummer **WMAD** broadcast. Addr: Pittsburgh. (Provance, OH)

WARI- 7415 at 0345. Dr. Lobotomy has announced plans to supplement his 41 meter rock music transmissions with relays of other pirates on medium wave and 49 meter frequencies. Addr: Wellsville. (Robert Thomas, Bridgeport, CT)

WCYC- 7415 at 0200. The World's Craziest Young Children spice their rock music shows with random monologs. Addrs: Blue Ridge Summit and Merlin. (Murphy, VA)

WEED- 7415 at 0445. This pro-marijuana rock music station remains fairly active from an announced location in the Great Southwest. Addr: still none; uselessly solicits reports via radio DX programs. (Harwood, CA)

WMAD- 7415 at 0300. Hosts Al Jaffe and Midnight Rider combine rock music with humorous parody ads for firms like Kamikaze Airlines. Their interval signal is "Three Days" by Jane's Addiction. Addr: Wellsville. (Sehmehl, PA, and direct from the station)

WVOL, Voice of the Loon 7416 at 0315. Captain Willie broadcasts rock and comedy, although Michael says that they suffered jamming interference from the **Voice of the Night.** WVOL occasionally features a free ad for *MT*! (Sehmehl, PA)

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The Piccolist

Now that Piccolo is available on the Universal M8000, I decided to include my "Piccolist" in this month's issue. I started compiling it without the aid of a decoder about four years ago. Even though I wasn't able to read the traffic, the musical tones were easy to spot and I knew someday a decoder would be available.

After building my own box about two years ago, many of the unknowns were identified. Since then, many frequencies have become inactive, but ones like 14.827 or 10.235 operate just about every night. The following is an example of traffic.

> DE MSS
> YOU BE 555555,S
> HERE TO PAL
>
> TA A KK

Apparently MSS (operator's initials "TA") is giving his "PAL" a signal report of 5555's. This type of message is usually hand sent on the "OW" (order wire) channel. The OW usually sends the idle character which can be identified by the alternating tone numbers 5 and 6.

Many unknown frequencies were added to the list during Desert Storm that haven't been heard from since! One unknown not on the list was sent in by Dave Wilson. He tunes to 18.331 in the early mornings and copies almost continuous French traffic.

I also listed frequencies for the old Mark III system (still active in the evenings on 14,862 kHz) and the French Coquelet on 7,434 kHz. All 117 frequencies are separated into two databases that I can scan using the Datacom Software and an Icom R71A. I highly recommend the concept of keeping two databases because you can scan the known frequencies and periodically check the unknown's activity. It takes too long to scan all 117 and on any given night I listen to only two to four frequencies. I'm sure if there's a band opening, several more will "pop-up"!

With the M8000's ability to copy just about any mode, I thought that I could copy any signal out there until I came across 10,285.5 kHz! It uses 425 Hz shift but I wasn't able to sync up to it in any mode. It sounds very much like ARQ-E3, but the idle or data LED wouldn't light up! Drop me line if you can figure this one out.

On the other hand, I had no problem getting in sync with 10,524.2 using 425 Hz shift and ARQ-E3 running 192 baud. I had to sit on that one for several hours until I copied RFLI, Ft. de France, Martinique. That's typical of ARQ reception: It takes the right equipment and a lot of patience.

NNN

The Piccolist

Frequency	Call	Comments
5322.50 4 ch		
5333.50 1ch		
5750.00		old system
6844.00	MKD	Akrotiri Cyprus to MUH8
7434.00		French Coquelet
7585.00 1ch		
7779.00 2ch		
7822.00	MSS	Belize to MKK London
8086.00 1ch		
8095.40		
8126.00 1ch		
9053.00	MKK	London to MSS (Belize)
9151.00 1ch		
9244.00 2ch		
9265.00	MTS	Falkland to MKK ??
10235.00 2ch	MSS	Belize
10249.00	MKD	Akrotiri Cyprus to MUH8
10336.50 1ch		
10746.00 1ch		
10760.00 2ch	MKK	London to MSS (Belize)
10854.00	MUH8	
10967.00 2ch		
11156.00 2ch		
11440.00	MSS	Belize to MKK London
11465.50	MKD	Akrotiri Cyprus to MUH8
11514.00 2ch		
11584.00	MKK	London to MTS Falkland ?
12270.00 2ch	MSS	Belize to MKK London
12305.00 2ch		
12479.00		old system
13445.00 2ch	MKK	London to MSS Belize
13499.00 1ch		
13525.00 3ch		
13580.00 3ch	MKK	London to MTS Falkland ?
13822.00 1ch		
13968.00	MKD	Akrotiri Cyprus to MUH8
14368.00 3ch		
14373.00 3ch		
14414.00 2ch		1400 utc
14473.00 3ch	MKK	London to MSS Belize
14497.00	MSS	Belize to MKK London
14510.00	MKK	London to MTS Falkland ?
14587.00 3ch		
14593.00 2ch	MTS	Falkland to MKK
14646.00 1ch		
14679.00 1ch		repeating tones
14710.00	MSS	Belize to MKK London
14727.00		
14828.00	MSS	Belize to MKK London
14847.00 2ch		
14853.00		
14862.00		old system
15778.00 4ch		
15815.00	MSS	Belize to MKK London
15855.00 1ch	MTS	Falkland 1ch to MKK
15870.00	GYU	Gibraltar to ?
16003.60		
16097.00		old system
16165.00 1ch		
16179.00		

Frequency	Call	Comments
16205.00 1ch	MKK	London to MTS Falkland ?
16233.00	MKD	Akrotiri Cyprus to MUH8
16254.00	MUH8	
16270.00	MKK	Belize to MKK London
16281.00 1ch		
16320.00 1ch		
16334.00		
16344.00 3ch	MKK to MSS	Belize
16390.00 3ch	MTS	Falkland
16842.00 3ch		
17445.00 1ch		
17459.00 1ch		
17507.00 1ch		
17515.00	MKK to MSS	Belize
18057.00 3ch	MKK to MTS	Falkland ?
18178.00 1ch		
18420.00	MSS	Belize to MKK London
18479.00 1ch		
18482.00 1ch		
18512.00	MKK to MSS	Belize
18525.00 3ch	MKK to MSS	Belize
18642.00 1ch		
18706.00 1ch		
18750.00 1ch	MKK to MTS	Falkland ?
18879.00 3ch	MTS	Falkland to MKK
18941.00	MSS	Belize to MKK London
19005.00 2ch	MSS	Belize to MKK London
19056.50	MKD	Akrotiri Cyprus to MUH8
19165.00		
19500.00 1ch		
19546.00 1ch		
19613.00 3ch		
19810.00	MKK	London to MSS Belize
19915.00	MKK	London to MSS Belize
20124.00	MKD	Akrotiri to MUH8
20135.50		old system
20137.70		old system
20161.00 1ch		
20170.00 1ch	MKK to MSS	Belize
20265.00 2ch	MKK to MTS	Falkland
20285.00	MSS	Belize to MKK London
20308.00	MTS	Falkland to MKK
20436.00 2ch	MKK to MTS	Falkland ?
20554.00 1ch		
20600.00 2ch		
20986.00 3ch		
22790.00		
22890.00		Falkland ?
22922.00	MSS	Belize to MKK London
23177.00 2ch		
23374.00	MKD	Akrotiri Cyprus to MUH8
23543.00 1ch		
23680.00 3ch		
23761.00	MKK	London to MSS Belize
23794.00	MUH8	
23850.00	MKK	London to MTS Falkland ?
24333.00	MSS	Belize to MKK London
24661.00 1ch		

Looking for some QSL tips? Radio Netherlands is offering a booklet, free of charge, *Writing Useful Reception Reports*. General Hints, The Backward Secret to the SIO Code, and Latin American DXing are a few topics covered. Send for your copy to, P.O. Box 444, 1200 JJ Hilversum, Netherlands.

Radio Havana Cuba is asking DXers to send their reports to the attention of their Correspondence Dept, P.O. Box 6240, Havana.

If you're after a QSL from VOA's Botswana Relay, try sending your report to the "Botswana QSL Desk." After a rocky start, QSLs for this new relay site are being widely received. Send your reports to; Voice of America, Washington, DC 20547.

BULGARIA

Radio Sofia, 9700 kHz. Full data color scenery card, unsigned. Station stickers, and program schedules included. Received in 163 days for an English report. Station address: 4 Dragan Tsankov Blvd., Sofia, Bulgaria. (Doug Merkel, St. Louis, MO)

CANADA

CHU, 7335 kHz. Partial data Sanford Fleming card, unsigned. Received in 21 days for an English report. Station address: National Research Council, Ottawa, ONT, Canada K1A OR6. (Richard Redmon, Vancouver, WA)

Halifax Coast Guard Radio- VCS, 6513 kHz. Full data 4-view photo of station complex, verified by Robert N. Ward-Radio Operator. Received for an English utility report, mint stamps (returned), and address label. Station address: Ketch Harbor, Halifax County, Nova Scotia, Canada BOJ 1XO. (Mike Hardester, Jacksonville, NC)

CHINA

Radio Beijing, 9770 kHz. Full data color scenery card, unsigned. Program schedule, stickers, and *The Messenger* magazine. Received in 14 days for an English report. Station address: Beijing 100866, China. (Loyd Van Horn, New Orleans, LA)

CZECHOSLOVAKIA

Radio Prague, 5930/7345 kHz. Full data color scenery card, verified with initials. Station sticker, schedule, and station brochures included. Received in 14/16 days for an English report. Station address: Vinohradska 12, 120 99 Prague 2, Czechoslovakia. (Ernest T. Bagley, S. Portland, ME) (Nicholas P. Adams, Pt. Murray, NJ)

EL SALVADOR

Radio Venceremos, 6750 kHz. Full data 'Certificado de Sintonia' card, verified by Anita Ocampo. My prepared card with partial data returned with QSL. QSL address: c/o El Salvador Media Project, 335 West 38th St., New York, NY 10018. European address: SRV Press Bureau, Scharnhorststr.6, 5000 Koln 60, Germany. The station requests U.S. $1 for return postage instead of IRCs. (Hardester,NC) *Thanks Mike, I'm still chasing this QSL! (GVH)*

INDONESIA

Sumatra:Radio Republik Indo-Bengkulu, 3265 kHz. Full data Indonesian letter and card, verified by Dr. Hamdan Syahbeni. Two station decals included. Received for an Indonesian report. Station address: Stasiun Regional 1 Bengkulu, Jalan Letjen. S. Parman 25, Kotak Pos; 13 Kawat. (Hardester, NC)

KUWAIT

Radio Kuwait, 15505 kHz. Full data blue QSL folder, verified by Ali N. Jaffar-Chief of Frequency Management. Station information and frequency schedule included. Received in 87/93 days for an English report and 3 IRCs. Station address: P.O. Box 397, 13004, Safat, Kuwait. (Steven Cline, Indianapolis, IN) (Adams, NJ)

NEW ZEALAND

ZLO-Royal New Zealand Navy, 12718.5 kHz. Full data station letter, verified. Received in 26 days for an English utility report and two IRCs. Station address: Private Bag 1704, Waiouru, New Zealand. (Stanley Klemanowicz, Torrance, CA)

ZKLF-New Zealand Meteorological Service, 16339.1 kHz. Full data personal letter, verified by M. Bale-Forecast Production Manager. Station FAX transmission schedule included. Received in 47 days for a copy of FAX report, and 2 IRCs (returned). Station address: National Forecast Production Manager, 30 Salamanca Rd., P.O. Box 722, Wellington 1, New Zealand. (Nagl Martin, Austria DX Club)

PAKISTAN

Pakistan Naval Radio-AQP, 13011 kHz. Full data lightpaper card, and cover letter, verified by Muhammad Azan Khan-Lt. Cmdr, PN., Staff Officer (SIGs)-II. Received for an English utility report, mint stamps, and address label (both used). Station address: Directorate of Signals, Operations Division, Naval Headquarters, Islamabad, Pakistan. (Hardester, NC)

SHIP TRAFFIC

HMNZS CANTERBURY-ZMCR, 8213 kHz (Royal New Zealand Navy frigate F-421). Full data prepared QSL card stamped with the warship's date stamp, and friendly "good on yer mate" letter from S.N. Kaye-Radio Supervisor. Photo card of the ship included. Received in 15 months for an English utility report, one U.S. dollar, and a souvenir postcard. Ship address: c/o Overseas Branch, CPO Auckland, New Zealand. (Rick Albright, Merced, CA)

M/S KOELPINSEE-Y5LM, 22018 kHz (Ex-East German container ship). Partial data prepared form QSL card stamped with official ship's name, and color photo of ship. Verified by Gertud Wilde-Radio Officer. Received in 110 days for a German utility report, two U.S. dollars, and a souvenir postcard. Ship address: c/o Deutsche Seereederei, Ueberseehafen Postfach 188, 0-2500 Rostock, Germany. (Albright, CA)

USS BOONE-NNNOCZN Mars Station, 14470 kHz. Full data prepared QSL card verified by Kevin Myers-FC1, Mars Operator. Received in two months for an English utility report, and a self-addressed-stamped-envelope. Ship address: FPO Miami, FL, 34093-1484. (Ed Rausch, Cedar Grove, NJ)

USCGC MATAGORDA-NAYM, 8984 kHz. Full data prepared QSL card verified by Lt. John Kaptinski CO. Business card and ship info sheet included. Received in 10 days for an English utility report and a self-addressed-stamped-envelope. Ship address: 100 MacArthur Causeway, Miami Beach, FL 33139. (Rausch, NJ)

SEA CHALLENGER-JKHH, 15665 MHz. (Car Carrier). Full data prepared QSL card verified by Radio Officer. Received in eight days for an English utility report and one U.S. dollar. Ship address: Kawasaki Kisen K.K. ('K' Lines), Hibiya Central Bldg. 2-9, 1 Chome, Nishi-Shinbashi, Minato-ku, Tokyo 105, Japan.(Hank Holbrook, Dunkirk, MD)

SATURN DIAMOND-3EWQ, 156.65 MHz. (Pure Car Carrier). Full data prepared QSL card verified by Radio Officer. Received in 173 days for an English utility report and one U.S. dollar. Ship address: Chung Gai Ship Management Co., Ltd., Admiral Center Tower One, 31 St Floor, 18 Haircourt Road, Hong Kong. (Holbrook, MD)

UNITED STATES

PIRATE: Action Radio, 7415.6 kHz. Full data Rep. of Nebraska letter, unsigned. 'Bo Gritz for President' letter, and station info sheet. Received in 80 days for an English report, and three mint stamps. Station address: P.O. Box 452, Wellsville, NY 14895. (Hardester, NC) (Adams, NJ) (Frank Hillton, Charleston, SC)

WWV, 15000 kHz. Full data WWV card, verified by John B. Milton. Information booklet included. Received in 14 days for an English report and mint stamp. Station address: 2000 East County Rd. # 58, Ft. Collins, CO 80524. WWVH, 15000 kHz. Full data color card, verified by Dean Okayama-Engineer in Charge. Received nice personal letter from veri signer, and station booklet. Received in 14 days for an English report and mint stamp (returned). Station address: P.O. Box 417, Kekaha, HI 96752. (Van Horn, LA)

VANUATU

Radio Vanuatu, 3945 kHz. Full data Slit Gong (Tam Tam) card verified. Received in 32 days for an English report, mint stamps, (not used), and Guam souvenir postcard. Station address: P.O. Box 49, Port Vila, Rep. of Vanuatu. (David Norcross, Barrigada Hts, Guam)

U.S. Department of Commerce
NATIONAL BUREAU OF STANDARDS
RADIO STATION WWV
FORT COLLINS, COLORADO

2.5 MHz-40°40'55"N, 105°02'31"W
5 MHz-40°40'42"N, 105°02'25"W
10 MHz-40°40'48"N, 105°02'25"W
15 MHz-40°40'45"N, 105°02'25"W
20 MHz-40°40'53"N, 105°02'29"W

This is to confirm your reception report of WWV

on [Frequencies] MHz [Time] UTC [Date]

Serial № 27875 John B. Milton
Engineer-in-Charge

☆ GPO679-168

This WWV QSL was submitted by Daniel Jacobs of Elizabeth, NJ. For more information on station WWV, see the feature article on page 22.

English language

shortwave guide

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Time) 4,5,6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday
M: Monday
T: Tuesday
W: Wednesday
H: THursday
F: Friday
A: SAturday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz..

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location, and conditions.

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	me:	Middle East
na:	North America	as:	Asia
ca:	Central America	au:	Australia
sa:	South America	pa:	Pacific
eu:	Europe	va:	various
af:	Africa	do:	domestic broadcast
me:	Middle East	om:	omnidirectional

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots

Jamming of RFPI Continues: Radio for Peace International station manager James Latham announced on a recent mailbag segment that the station was still experiencing jamming on their frequency of 7375. He suggests listeners who encounter jamming on this frequency from the hours of 0000 to 0800 UTC try tuning up to 7385. The station plans to put an extra transmitter into use to help overcome what they believe to be malicious interference.

If you've never tuned in to RFPI, they have been known to broadcast some very controversial programming that at times has been highly critical of U.S. foreign and domestic policy. RFPI can be heard 24 hours on 15030, 13630 and 7375 kHz and from 1800 to 0000 UTC on 21465 kHz.

Technical Problems for Voice of Nigeria: In mid-August, Voice of Nigeria's West African Service was monitored on 7260 instead of the usual 7255. What at first was thought to be a possible test transmission was in fact a frequency punch-up error by the technical staff. With Nigeria off frequency, this revealed daily English language news from co-channel Radio Botswana at 0510 to 0520 UTC.

It seems puzzling that two stations broadcasting on the same continent at the same time would use the same frequency. For an easier shot at hearing Botswana in English, try the VOA's Moepeng Hill relay station on 7265 between 0300 and 0500 UTC.

Radio Free Europe, On or Off?: The chairman of the House Foreign Affairs Committee, Dante Fascell, has issued a statement supporting authorized transmissions by Radio Free Europe to war-torn Yugoslavia. Additional funding would be needed for the broadcasts.

The continuance of Radio Free Europe and Radio Liberty has been a subject of controversy. In August, a government advisory panel concluded that the broadcasts should be phased out. Malcolm Forbes, Jr, chairman of the Board for International Broadcasting, responded in an Associated Press article, "The myopia of this advisory commission about the events in Eastern Europe and the Soviet Union is simply astonishing."

Radio Yugoslavia is currently broadcasting to North America on 11870 kHz from 0030 to 0100 and again from 0130 to 0200 with fair to good reception.

English Language Listeners Please Respond: The future of English transmissions from Radio Norway International is uncertain since the Norwegian Foreign Ministry has decided to withdraw its support to foreign language programs for the coming year. This support had made it possible to double the number of transmissions in English from once to twice weekly. Radio Norway has been broadcasting a thirty minute program in English worldwide every Saturday and Sunday.

The Norwegian National Broadcasting Corporation is financed through license fees and does not consider it a prime task to broadcast to foreign audiences. Discussions about the future of the English transmissions is now taking place and RNI solicits your comments. Send to: Gundel Krauss Dahl, Radio Norway International, 0340 Oslo, Norway.

IRRS-Shortwave Test Broadcasts: During the summer, IRRS-Shortwave (Italian Radio Relay Service) broadcast programming especially intended for American audiences for the first time in several years. These broadcasts included items such as news from the UN and UNESCO, music, the weekly DX/mailbag program "Hello There," and religious programming.

If you have heard these transmissions or wish to write IRRS-Shortwave with your support, please send your reception report or comments to Anna Boschetti, NEXUS-International Broadcasting Association, P.O. Box 10980, I-201120 Milano, Italy.

Thanks to David Datko, Steve Forest, Gundel Dahl and Anne Boschetti for this month's news items.

English language **shortwave guide**

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

Greg Jordan
Frequency Manager
North Carolina
Call 919-661-0095 7-11 pm with updates

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

John Carson
Oklahoma

Jim Frimmel
Texas

Dave Datko
California

B.W. Battin
New Mexico

November Deadline: October 2

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(8:00 PM EDT, 5:00 PM PDT)
BBC
CBC, Northern Quebec [S]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l
Radio Thailand
Radio Vilnius
SBC Radio 1, Singapore
Spanish National Radio
Swiss Radio Int'l
Voice of America
0005
Radio Pyongyang
0010
Radio Beijing*
0030
All India Radio
BRT, Brussels
Christian Science Monitor (SE Asia) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Korea
Radio Netherlands
Voice of America (Americas, East Asia) (Special English) [T-S]
Voice of America (East Asia) (Special English) [M]
0035
All India Radio (News Service)
0045
Radio Korea (News Service)
0055
WRNO [H, A]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
BBC
CBC, Northern Quebec
Christian Science Monitor
Croatian Radio, Zagreb [M-A]
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l
Radio Sofia
Radio Tashkent
Radio Thailand
Radio Ukraine Int'l
Radiotelevisione Italiana
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Indonesia
WWCR [T-A]
0115
Radio Havana Cuba* [T-S]
0125
Radio Korea [T-A]
0130
Christian Science Monitor (SE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Netherlands
Radio New Zealand Int'l [M-F]
Radio Yugoslavia
Voice of Greece [M-A]
0155
Voice of Indonesia
WRNO [W, A]

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Croatian Radio, Zagreb [S]
Deutsche Welle
Radio Australia
Radio Canada Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Romania Int'l
Radio RSA
Radio Thailand
RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]
0215
Radio Cairo
Radio Nepal
0230
Christian Science Monitor (Africa, Middle East) [M]
Christian Science Monitor [T-F]
HCJB
Radio Finland [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana
Radio Yugoslavia
SLBC, Sri Lanka
0245
All India Radio (News Service)

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Budapest
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio RSA
Radio Thailand
SBC Radio 1, Singapore
Voice of America
Voice of Free China
WWCR [T-A]
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (Africa)*
Christian Science Monitor (Africa, Middle East) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l [T-A]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Iraq Int'l
Radio Netherlands
Radio Tirana
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radio Yerevan
0355
Radio Japan [M-F]

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [T-F]
Radio Romania Int'l
Radio RSA
Radio Sofia
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Turkey
WRNO [F]
WWCR [T-A]
ZNBC Radio 2, Lusaka
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
BBC (Africa)* [M-A]
Christian Science Monitor (Africa, Asia) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Botswana
Radio Havana Cuba [T-S]
0450
Radio RSA
0455
WYFR (Network) [T-A]

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC ("Newshour")
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
HCJB
Kol Israel
Radio Australia
Radio Bahrain
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l [W-F]
Radio RSA
Radio Thailand
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
ZNBC Radio, Lusaka
0510
Radio Botswana
0530
Christian Science Monitor (Africa, Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0545
Voice of Nigeria*
0550
Radio For Peace Int'l [T-A]

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio RSA
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WWCR
ZNBC Radio, Lusaka [M-A]
0605
Radio Pyongyang
0609
BBC*
0610
Voice of Malaysia
0615
Radio Canada Int'l [M-F]

newsline

0620
Radio Finland [T-A]
0630
BBC (Africa)*
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0645
Radio Romania Int'l
Voice of Nigeria*
0655
Radio Korea [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio, Accra
MBC, Blantyre [M-A]
Radio Australia
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Myanmar
WWCR [M-A]
0703
Croatian Radio, Zagreb [M-A]
0705
Radio Pyongyang
0715
Radio Havana Cuba* [T-S]
0730
All India Radio (News Service)
BBC (Africa)* [M-A]
BRT, Brussels
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Czechoslovakia
Radio Ghana
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands
0745
Radio Finland [T-A]
Radio For Peace Int'l [T-A]
0755
Radio Japan [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
ZNBC Radio 2, Lusaka [M-A]
0803
Croatian Radio, Zagreb [S]
0805
Radio Pyongyang
0810
Voice of Malaysia
0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow (World Service)
Radio Netherlands
0840
Voice of Greece [M-A]
0850
All India Radio (News Service) (Special English)
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
MBC, Blantyre M-A]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Finland [T-A]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0903
Croatian Radio, Zagreb [M-A]
0910
Radio Beijing*
0915
Radio Korea (News Service)
0930
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Afghanistan
Radio Finland [T-A]
Radio Moscow
Radio Netherlands
0940
Radio Togo
0950
Radio Pacific Ocean [A]
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
BRT, Brussels [M-A]
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Moscow
Radio New Zealand Int'l [S-M, W-H]
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
ZNBC Radio 2, Lusaka [M-A]
1003
Croatian Radio, Zagreb [S]
1010
Radio Beijing*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
Kol Israel
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Pakistan
Radio RSA
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Belize [M]
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Czechoslovakia
Radio Lesotho
Radio Moscow
RTM, Malaysia*
1135
All India Radio (News Service)
Radio Thailand
1150
Radio RSA
1155
Radio Japan [M-F]
Radio Korea [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Jordan
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Sofia
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Voice of America
WWCR [M-F]
1209
BBC* [M-A]
1210
Radio Beijing*
1215
HCJB [M-F]
Radio Korea
1225
Radio Finland [T-F]
1230
All India Radio (News Service)
BRT, Brussels [S]
Christian Science Monitor [M-F]
Radio Cairo
Radio France Int'l
Radio Moscow
Radio Yugoslavia
SLBC, Sri Lanka
TWR, Bonaire [A-S]
1235
Voice of Greece
1245
SLBC, Sri Lanka
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
CBC, Northern Quebec [A-S]
Christian Science Monitor
GBC Radio, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Canada Int'l [M-F]
Radio Moscow
Radio New Zealand Int'l
Radio Romania Int'l
Radio Tanzania [A-S]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WWCR [M-F]
1303
Croatian Radio, Zagreb
1305
Radio Pyongyang
1310
Radio Beijing*
Radio Korea [M-F]
1320
SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l (Asia)
Radio Finland [T-F]
Radio Moscow
Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Special English)
Voice of Turkey
1346
All India Radio [A]
1350
Radio For Peace Int'l [T-A]
1355
WYFR (Network) [M-F]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
BRT, Brussels [M-A]
CBC, Northern Quebec
Christian Science Monitor
GBC Radio, Accra
Kol Israel
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l [S]
Radio Finland [A]
Radio France Int'l
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
ZNBC Radio 2, Lusaka [M-F]
1410
Radio Beijing*
1415
Radio Korea (News Service)
Radio Nepal
1425
HCJB [M-F]
1430
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Finland [T-F]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
Radio Tirana
1445
BBC (East Asia) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
National Unity Radio, Omdurman
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-A]
Radio Canada Int'l [S]
Radio Japan

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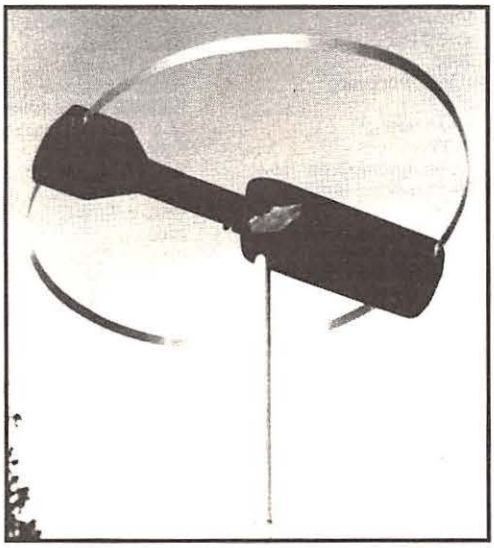
Shortwave Solution



The IsoLoop 10-30 HF antenna is designed to work in limited space applications — apartments, condos, etc. Don't be deceived by its compact size (43" diameter) — it really works! Features include: Continuous coverage from 10 to 30 MHz; narrow bandwidth to suppress out-of-band signals; comes fully assembled (no mechanical joints); much more.

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CompuServe I.D. 76702,1013

newsline

Radio Moscow
Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
WWCR [M-F]
1505
Radio Finland [T-A]
Radio Pyongyang
1510
Radio Beijing*
1515
Radio Canada Int'l (Europe)
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Moscow
Radio Netherlands
Voice of Ethiopia
Voice of Greece [M-A]
Voice of Nigeria
1540
Voice of Nigeria*
1545
Radio For Peace Int'l [T-A]
Radio Korea (News Service)

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
MBC, Blantyre
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow
Radio Pakistan
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1620
Radio Tallinn [M-F]
1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Canada Int'l
Radio Moscow
UAE Radio, Dubai
Voice of America (Europe) (Special English)
1655
Radio Korea [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio 2, Accra
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Jordan
Radio Moscow
Radio Pakistan
Radio RSA
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
1705
Radio Pyongyang
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
WYFR (Network) [A]
1735
WYFR (Network) [M-F]
1740
BBC (Africa)*
1750
Radio RSA

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Polish Radio, Warsaw
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Canada Int'l
Radio Czechoslovakia
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Tanzania
Voice of America
ZNBC Radio, Lusaka
1815
ZNBC Radio 2, Lusaka*
1825
WYFR (Network) [A]
1830
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Belize
Radio Kuwait
Radio Moscow
Radio Netherlands
Radio Sofia
Voice of America (Special English)

1840
Voice of Greece
1845
Radio Cote d' Ivoire
Radio Guinea, Conakry
1855
BBC (Africa)* [M-F]

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [M-H]
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l [M-F]
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Romania Int'l
Radio Tanzania
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Czechoslovakia
Radio Finland [M-F]
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Yugoslavia
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Togo
1955
BBC (Africa)* [M-F]
Radio Finland
Radio Korea [M-F]
WYFR (Network) [M-A]

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
ZNBC Radio 2, Lusaka
2005
Radio Pyongyang
2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Polish Radio, Warsaw
Radio Havana Cuba [M-A]
Radio Moscow
2045
Radio Korea (News Service)
Radio Sofia
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Czechoslovakia
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Romania Int'l
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka
2110
Radio Beijing*
2125
WYFR (Network) [M-F]
2130
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Cairo
Radio Moscow
WYFR (Network) [A]
2145
Radio Korea
2150
Radio For Peace Int'l [M-F]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor
CIQX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Beijing
Radio Budapest
Radio Canada Int'l
Radio Czechoslovakia
Radio Havana Cuba [M-A]
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tirana
Radio Ukraine Int'l
Radio Yugoslavia
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China
2203
Croatian Radio, Zagreb
2209
BBC*
2210
Radio Beijing*
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Kol Israel
Radio Finland [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
Voice of America (Special English)
WYFR (Network) [M-F]
2240
Radio Korea [M-F]
2245
GBC Radio, Accra
Radio Sofia
Radio Yerevan
Voice of Greece
2255
WYFR (Network) [M-A]

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
2305
Radio Pyongyang
2320
Radio Thailand
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
RTM, Malaysia*
2340
Radio Yerevan
2345
Radio For Peace Int'l [M-F]
SLBC, Sri Lanka [M]
2355
Radio Japan [M-F]

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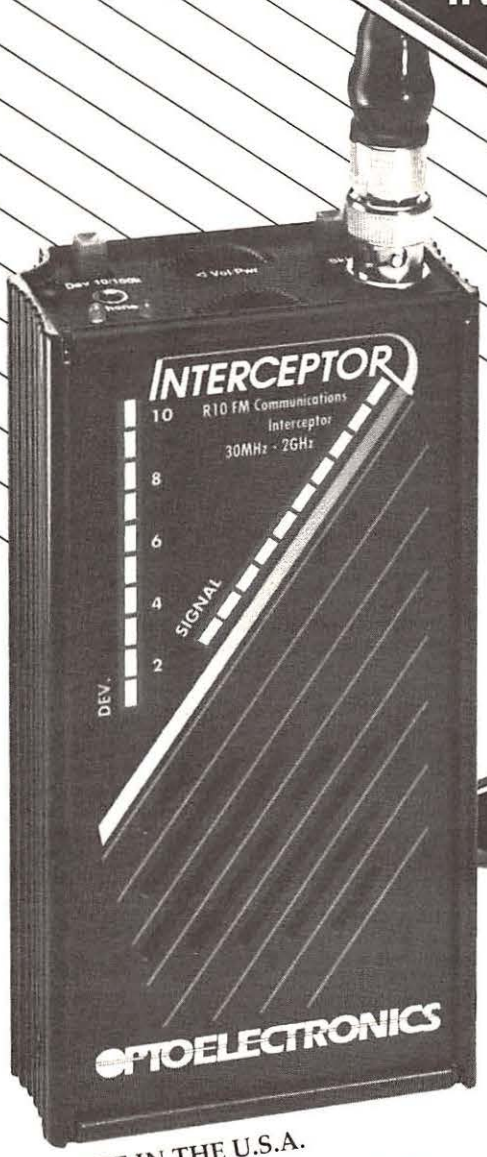

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- Signaling Tones (CTCSS)
- Modulation Monitor
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APS-104 (Extends RF detection distance 10x)	$ 995.
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0000 UTC [8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0027	Czechoslovakia	7345na	9580na	11990na	
0000-0030	Australia	15170va	15320va	17630as	17750as
		17880as			
0000-0030	Canada, RCI Montreal	5960am	9755am	13670am	
0000-0030 a /var	Croatian Radio via WHRI	7315na	9495na		
0000-0030	Iran, Islamic Republic	9022am	15260am	15315am	
0000-0030 sm	Norway	15165am			
0000-0030	Swiss Radio Int'l	6135na	9650na	9885na	12035na
		17730na			
0000-0030	United Kingdom,BBC London	5965as	5975na	6005af	6175na
		6195as	7145as	7325na	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15360pa	17830as		
0000-0045	Bulgaria, Radio Sofia	11660na	11720na	15330na	
0000-0050	North Korea	11335na	13760na	15115na	
0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, Radio Beijing	9770na	11715na		
0000-0100	Cook Islands	11760pa			
0000-0100	Costa Rica, AWR	9725ca	11870ca		
0000-0100	Costa Rica, RFPI	7375na	13630na	15030na	
0000-0100	Cuba, RHC Havana	11950am			
0000-0100	Guam, KSDA Guam	15610as			
0000-0100	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0000-0100	Luxembourg, RTL	15350va			
0000-0100	Malaysia, RTM Radio 4	7295do			
0000-0100	New Zealand, RNZI	17770pa			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow	11710va	11780va	11850va	12050va
		15290va	15405va	15410va	15425va
		15485va	15560va	17560va	17570va
		17860va	17890va	21690va	
0000-0100	Sierra Leone, SLBS	3316do			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	South Korea, Seoul	15575na			
0000-0100	Spanish National Radio	9530na			
0000-0100	Thailand	4830as	9655as	11905as	
0000-0100	Ukraine, Kiev	7195eu	7250eu	9640eu	10344eu
		11520eu	15570na		
0000-0100	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0000-0100 sa	USA, CSMonitor Boston	17865as			
0000-0100	USA, KTBN Salt Lake City	15590am			
0000-0100	USA, KVOH Los Angeles	17775am			
0000-0100	USA, VOA Washington	6130am	7405am	9455am	9775am
		11580am	11695am	15120am	15205am
0000-0100	USA, WHRI Noblesville	7315am	9495am		
0000-0100	USA, WINB Red Lion, Penn.	15145eu			
0000-0100	USA, WJCR Upton, Kentucky		7490na		
0000-0100	USA, WRNO New Orleans	7355am			
0000-0100	USA, WWCR Nashville	7435na	12160na		
0000-0100	USA, WYFR Okeechobee, FL		5985am		
0030-0100	Australia	15320va	15365pa	15420pa	17630as
		17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0030-0100 sm	Canada, RCI Montreal	5960am	9755am		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	21455am	
0030-0100	Netherlands	6020na	6165na	9860as	11655as
		11835na	13700as		
0030-0100	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0030-0100	United Kingdom,BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15360pa		
0030-0100 WAR/var	Yugoslavia	11870am			
0030-0100	Yugoslavia, Belgrade	11870na			
0045-0100	South Korea World News	7275as			

SELECTED PROGRAMS

Sundays

0000 Radio Norway Int'l: Norway Today. A magazine program on issues and people affecting modern-day Norway.
0005 Christian Science Monitor: Herald Of Christian Science. Religious programming explaining the doctrine of Christian Science.
0005 Swiss Radio Int'l: Grapevine. Listener letters and comment.
0018 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. Bob Thomann and Bob Zanotti present shortwave radio news and advice.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.

Mondays

0000 Radio Norway Int'l: Norway Today. See S 0000.
0005 Christian Science Monitor (Americas, Europe, Africa): The Sunday Service. See S 1605.
0005 Swiss Radio Int'l: Feature. See S 0605.
0006 Christian Science Monitor (SE Asia): News Features And Interviews. In-depth news analyses, focusing on major international events.
0030 BBC: In Praise Of God. Christian religious services and meditations.

Tuesdays

0005 Swiss Radio Int'l: Dateline. See M 0605.
0006 Christian Science Monitor: News Features And Interviews. See M 0006.
0030 BBC: Panel Game. How's your science knowledge? Quiz yourself on "The Litmus Test."

Wednesdays

0005 Swiss Radio Int'l: Dateline. See M 0605.
0006 Christian Science Monitor: News Features And Interviews. See M 0006.

Thursdays

0005 Swiss Radio Int'l: Dateline. See M 0605.
0006 Christian Science Monitor: News Features And Interviews. See M 0006.
0030 BBC: Comedy/Drama (except 29th: Two Cheers For October). See W 1530.

Fridays

0005 Swiss Radio Int'l: Dateline. See M 0605.
0006 Christian Science Monitor: News Features And Interviews. See M 0006.
0030 BBC: Music Feature. From Bach to Beethoven, it's "The Story Of Western Music" (through November 27th).

Saturdays

0005 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0005 Swiss Radio Int'l: Dateline. See M 0605.
0030 BBC: From The Weeklies. A review of the British weekly press.
0045 BBC: Recording Of The Week. See M 0615.

0100 UTC [9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0115	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0100-0120	Italy, RAI, Rome	9575am	11800am		
0100-0125	Netherlands	6020na	6165na	9860as	11655as
		11835na	13700as		
0100-0127	Czechoslovakia	5930na	7345na	9580na	
0100-0130 twhfa	Canada RCI Montreal	5960am	9755am		
0100-0130	Laos, National Radio of	7116as			
0100-0130 sm	Norway	9615am			
0100-0130	Sweden	9685as	11730as		
0100-0130	Uzbekhistan, R. Tashkent	5930as	5995as	7190as	7265as
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na
		9700na	11810na	11865na	13610na
		13770na	15105na		
0100-0159 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am
		13720am			
0100-0200	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Cook Islands	11760pa			
0100-0200	Costa Rica, RFPI	7375na	13630am		
0100-0200	Cuba, RHC Havana	11950am			
0100-0200	Ecuador, HCJB Quito	9745am	15155am	21455am	
0100-0200	Indonesia, Voice of	7125as	9675as	11752as	11785as
0100-0200	Japan NHK	5960na	11840me	15195as	17810as
		17835as	17845as		
0100-0200	Luxembourg, RTL	15350va			
0100-0200 smtwh	Malaysia, RTM Radio 4	7295do			
0100-0200	Namibia BC Corp, Windhoek	3290af			
0100-0200	New Zealand, RNZI	17770pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow	11710va	11780va	11850va	12050va
		15290va	15405va	15410va	15425va
		15485va	17560va	17560va	17570va
		17655va	17860va	17890va	21690va
0100-0200	Sierra Leone, SLBS	3316do			
0100-0200	Singapore, SBC1	5010do	5052do	11940do	
0100-0200	Spanish National Radio	9530na			
0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0200	Thailand	4830as	9655as	11905as	
0100-0200	United Kingdom, BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15280as	15360pa	17790va
		21715as			
0100-0200	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0100-0200 sa	USA, CSMonitor Boston	17865as			
0100-0200	USA, KTBN Salt Lake City	7510na			
0100-0200	USA, VOA Washington	5995am	6130am	7405am	9455am
		9775am	11580am	15120am	15205am
		7115as	7205as	9740as	11705as
		15250as	17735as	21550as	
0100-0200	USA, WHRI Noblesville	7315am			
0100-0200	USA, WINB Red Lion, Penn.	15145na			
0100-0200	USA, WJCR Upton, Kentucky		7490na		
0100-0200	USA, WRNO New Orleans	7355na			
0100-0200	USA, WWCR Nashville	7435na	12160na		
0100-0200	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0130-0155	Finland, YLE	11755na	15185na		
0130-0200	Austria, ORF Vienna	9875na	13730na		
0130-0200	Netherlands	9860as	11655as	13700as	
0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
0130-0200 WAR/var	Yugoslavia	11870na			
0145-0200	Vatican Radio	9650as	11935as		

SELECTED PROGRAMS

Sundays

0100 Radio Norway Int'l: Norway Today. See S 0000.
0101 BBC: Play Of The Week. This month's offerings: "Ubu Roi" (4th); "Double Cross" (11th, 18th); "The Shape Of The Table" (25th, starts at 0030 UTC).
0105 Christian Science Monitor Herald Of Christian Science. See S 0005.
0109 Deutsche Welle: Commentary. Opinion on current issues.
0117 Deutsche Welle: Feature. "Mailbag," "Nickelodeon" (listener requests for German music), or "Technical Tips For DXers."
0134 Deutsche Welle: German By Radio. An advanced German language course for English speakers.

Mondays

0100 Radio Norway Int'l: Norway Today. See S 0000.
0101 BBC: Feature/Drama. This month, hear "Tennyson" (5th); "Salem Witch Hunt: 1692" (12th); "All My Hope" (19th); "In Their Element" (26th).
0106 Christian Science Monitor (SE Asia): Encore. Re-runs of the best programs from the week just past.
0109 Deutsche Welle: Commentary. See S 0109.
0116 Deutsche Welle: Living In Germany. A weekly look at the social scene in Germany.
0134 Christian Science Monitor (SE Asia): Letterbox. Staff members respond to listener letters.
0134 Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0145 BBC: Feature. The life story of violinist Guiseppe Tartini is the subject of "The Devil's Trill" (through November 2nd).
0147 Christian Science Monitor (SE Asia): Religious Article. A reading from The Christian Science Monitor.

Tuesdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Home Forum. See M 2306.
0109 Deutsche Welle: European Journal. See M 0209.
0130 BBC: Folk In Britain. Ian Anderson is the host, folk music is the fare.
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC (South Asia): South Asia Survey. In-depth analysis of political and other developments around the Indian subcontinent.
0145 BBC: Health Matters. New medical developments and methods ofkeeping fit.
0147 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Curtain Call. See T 2306.
0109 Deutsche Welle: European Journal. See M 0209.
0130 BBC: Talks. Michael Rosen reads listener selections on "Poems By Post" (through December 23rd).
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC (South Asia): South Asia Survey. See T 0145.
0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.
0147 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Kaleidoscope. See W 2306.
0109 Deutsche Welle: European Journal. See M 0209.
0130 BBC: Waveguide. See W 0415.
0134 Christian Science Monitor: Letterbox. See M 0134.
0140 BBC: Book Choice. See W 0425.
0145 BBC (South Asia): South Asia Survey. See T 0145.
0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.
0147 Christian Science Monitor: Religious Article. See M 0147.

Fridays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Arts Forum or Sportsworld. See H2306.
0109 Deutsche Welle: European Journal. See M 0209.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC (South Asia): South Asia Survey. See T 0145.
0145 BBC: Global Concerns. An update on environmental issues.
0147 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

0105 BBC: Outlook. See M 1405.
0105 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0109 Deutsche Welle: European Journal. See M 0209.
0130 BBC: Short Story (except 3rd, 31st: Seeing Stars). See S 0430.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0145 BBC (South Asia): South Asia Survey. See T 0145.
0145 BBC: Jazz Now And Then. George Reid presents a weekly mix of new releases, old tracks, and interviews.

0200 UTC [10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0225	Netherlands	9860as	11655as	13700as	
0200-0230 mtwhfa	Kenya, Voice of	4935do			
0200-0230 sm	Norway	11930na			
0200-0230	Philippines, FEBC Manila	15450as			
0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0200-0230	Sweden	9695na	11705na		
0200-0230	Swiss Radio Int'l	6135am	9650am	9885am	12035am
0200-0230	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135as	7325na	9410eu	9580as
		9590na	9670me	9915na	11750sa
		11955as	12095va	15260sa	15280as
		15360pa	15380as	17790as	21715as
0200-0230	USA, VOA Washington	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	15235as	15560as	
0200-0259 twhfa	Canada, RCI Montreal	9535sa	9755sa	11845sa	11940sa
		13720sa			
0200-0300 twhf	Argentina,RAE BuenosAires	11710am			
0200-0300	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750pa	17795pa	17880as
		21525as	21590as	21740pa	21775as
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	6070do	9610do		
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6035eu	6125eu	7230eu	7260eu
		9650eu			
0200-0300	Cook Islands	11760pa			
0200-0300	Costa Rica, RFPI	7375na	13630na		
0200-0300	Cuba, RHC Havana	11950na	13710na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	21455am	
0200-0300	Egypt, Radio Cairo	9475na	9675na		
0200-0300 as	Guam, KSDA Guam	13720as			
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na	
0200-0300	Luxembourg, RTL	15350va			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia BC Corp, Windhoek	3290af			
0200-0300	New Zealand, RNZI	17770pa			
0200-0300	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0200-0300	Russia, Radio Moscow	9470va	9530va	9685va	11710va
		11850va	12050va	15290va	15405va
		15410va	15425va	15560va	17560va
		17570va	17635va	17685va	17730va
		17850va	17860va	17890va	21690va
0200-0300	Sierra Leone, SLBS	3316do			
0200-0300	Singapore, SBC1	5010do	5052do	11940do	
0200-0300	South Africa, Radio RSA	7270af			
0200-0300	Taiwan, V. of Free China,	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0300	Thailand	4830as	9655as	11905as	
0200-0300	USA, CSMonitor Boston	9350af	9455na	13760sa	
0200-0300 sa	USA, CSMonitor Boston	17555as	17865as		
0200-0300	USA, KTBN Salt Lake City	7510am			
0200-0300	USA, KVOH Los Angeles	17775am			
0200-0300	USA, VOA Washington	7205as	9740as	11705as	15120am
		15205am	15250as	17735as	21550as
0200-0300	USA, WHRI Noblesville	7315na			
0200-0300	USA, WINB Red Lion, Penn.	15145eu			
0200-0300	USA, WJCR Upton, Kentucky		7490na		
0200-0300 vl	USA, WRNO New Orleans	7355am			
0200-0300	USA, WWCR Nashville	5920na	7435am		
0200-0300	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0230-0245	Pakistan	9515as	15115as	17640as	21730as
0230-0300	Albania, Radio Tirana	9580na	11825na		
0230-0300 s	Kenya, Voice of	4935do			
0230-0300	Netherlands	9860as	11655as	13700as	
0230-0300	Phillipines, Manila	17760pa	17840pa	21580pa	
0230-0300 twhfa	Portugal	9570am	9600am	9705am	11840am
0230-0300	Sri Lanka B'casting Corp.	9720as	15425as		
0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325na	9670me	9915na
		11750sa	11955me	12095va	15260sa
		15280as	15360pa	17790va	21715as
0245-0300 varies	Armenia, Radio Yerevan	11675na	13645am	15580na	
0245-0300 vl, var	Iraq, Radio Iraq Int'l	15340na	17740sa		
0245-0300	South Korea, Seoul	9640am	11805am	15575am	
0250-0300	Vatican Radio	7305na	9605na	11620na	
0255-0300	Bonaire, TWR Bonaire	11930am			

SELECTED PROGRAMS

Sundays

0200 Radio Norway Int'l: Norway Today. See S 0000.
0205 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0205 Swiss Radio Int'l: Grapevine. See S 0005.
0209 Deutsche Welle: Commentary. See S 0109.
0213 Deutsche Welle: Sports Report. The latest news from the world of sports.
0218 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
0219 Deutsche Welle: Mailbag Asia. Musical requests and answers to listener questions.
0230 BBC: Feature. This month's selections: "The Invaders' Legacy" (4th); "Remembering Proust" (11th, 18th); "The Evangelicals" (through November 8th).

Mondays

0200 Radio Norway Int'l: Norway Today. See S 0000.
0205 Christian Science Monitor (Americas): The Sunday Service. See S 1605.
0205 Swiss Radio Int'l: Feature. See S 0605.
0206 Christian Science Monitor (Africa, Middle East): News Features And Interviews. See M 0006.
0209 Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analyses.
0230 BBC: Composer Of The Month. Profiles of famous This technological developments.

Tuesdays

0205 Swiss Radio Int'l: Dateline. See M 0605.
0206 Christian Science Monitor: News Features And Interviews. See M 0006.
0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Quiz. See M 1215.
0234 Deutsche Welle: Man And Environment. A program on all topics relating to the environment in industrial and developing countries.

Wednesdays

0205 Swiss Radio Int'l: Dateline. See M 0605.
0206 Christian Science Monitor: News Features And Interviews. See M 0006.
0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Development '92. Aid and development issues for developing nations.
0234 Deutsche Welle: Insight. See T 1534.

Thursdays

0205 Swiss Radio Int'l: Dateline. See M 0605.
0206 Christian Science Monitor: News Features And Interviews. See M 0006.
0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
0234 Deutsche Welle: Living In Germany. See M 0116.

Fridays

0205 Swiss Radio Int'l: Dateline. See M 0605.
0206 Christian Science Monitor: News Features And Interviews. See M 0006.
0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Drama. See H 1130.
0234 Deutsche Welle: Spotlight On Sport. See W 1534.

Saturdays

0205 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0205 Swiss Radio Int'l: Dateline. See M 0605.
0209 Deutsche Welle: Commentary. See S 0109.
0223 Deutsche Welle: Panorama. A review of the major news events of the week.
0230 BBC: People And Politics. The background to the British political scene.
0234 Deutsche Welle: Economic Notebook. See F 1534.

0300 UTC [11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0315	Vatican Radio	7305na	9605na	11620na	
0300-0325	Netherlands	9860as	11655as	13700as	
0300-0330	Czechoslovakia	5930na	7345na	9540na	
0300-0330	Egypt, Radio Cairo	9475na	9675na		
0300-0330	Japan NHK	5960am	15230va	15325a	m 17810am
		17825am	21610am		
0300-0330	Phillipines, Manila	17760pa	17840pa	21580pa	
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6005sa
		6175na	6180eu	6190af	6195eu
		7135me	7325na	9410eu	9600af
		9670me	9915na	11730af	11760me
		11955me	12095eu	15070af	
0300-0330	United Kingdom,BBC London	11750sa	15260sa	15310as	21715va
0300-0330	USA, VOA Washington	5965eu	11905me	15160me	17810eu
		17895me			
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11810na	11890na	13610na	13770na
		15205na			
0300-0400	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21525as	21740pa	21775as	
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Bonaire, TWR Bonaire	9535am	11930am		
0300-0400	Bulgaria, Radio Sofia	9850af	11720af	11765af	15160na
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, Radio Beijing	9690na	9770na	11715na	
0300-0400	Cook Islands	11760pa			
0300-0400	Costa Rica, RFPI	7375na	13630na		
0300-0400	Costa Rica, TIFC	5055ca			
0300-0400	Cuba, RHC Havana	11950am	13710na		
0300-0400	Ecuador, HCJB Quito	9745am	15155am	21455am	
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Honduras, HRPC Luz y Vida	3250ca			
0300-0400	Kenya, Voice of	4935do			
0300-0400	Luxembourg, RTL	15350va			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400	New Zealand, RNZI	17770pa			
0300-0400	Russia, Radio Moscow	9470va	9685va	11675va	11710va
		11850va	12050va	15405va	15425va
		17570va	17605va	17665va	17735va
		17860va	17890va	21690va	
0300-0400	Sierra Leone, SLBS	3316do			
0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	South Africa, Radio RSA	5960af	7270af		
0300-0400	Sri Lanka B'casting Corp.	9720as	15425as		
0300-0400	Taiwan, V. of Free China,	5950na	9680na	9765as	11745as
		15345na			
0300-0400	Tanzania	5985af	9685af	11765af	
0300-0400	Thailand	4830as	9655as	11905as	
0300-0400	Turkey, Voice of	9445na			
0300-0400	USA, CSMonitor Boston	9350af	9455na	13760sa	
0300-0400 sa	USA, CSMonitor Boston	17555as	17865as		
0300-0400	USA, KTBN Salt Lake City	7510am			
0300-0400	USA, KVOH Los Angeles	9785sa			
0300-0400	USA, VOA Washington	6035af	7265af	7405af	9575af
		11835af	11940af	15115af	17715af
		21600af			
0300-0400	USA, WHRI Noblesville	7315na			
0300-0400	USA, WJCR Upton, Kentucky		7490na		
0300-0400 vl, irr	USA, WRNO New Orleans	7395am			
0300-0400	USA, WWCR Nashville	5920na	7435na		
0300-0400	USA, WYFR Okeechobee, FL		5985am	9505am	
0330-0400	Albania, Radio Tirana	9580na	11825na		
0330-0400	Austria, ORF Vienna	9870ca	13730am		
0330-0400	Japan NHK	5960na	11870na	17810na	
0330-0400	Netherlands	6165na	9590na		
0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175va
		6180eu	6190af	6195eu	9410eu
		9600af	9915na	11740af	11760me
		11955me	12095eu	15280as	15310as
		15420af	17885af	21715as	
0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	

SELECTED PROGRAMS

Sundays

0305 Christian Science Monitor: Herald Of Christian Science. SeeS 0005.
0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Sports Roundup. News from the world of sports.
0317 Deutsche Welle: Feature. See S 0117.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0334 Deutsche Welle: German By Radio. See S 0134.
0335 BBC (Africa): Postmark Africa. Answers to any question underthe sun.
0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

0306 Christian Science Monitor (Africa, Middle East): Encore. See M 0106.
0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Sports Roundup. See S 0315.
0316 Deutsche Welle: Living In Germany. See M 0116.
0330 BBC: Anything Goes. See S 1430.
0334 Christian Science Monitor (Africa, Middle East): Letterbox. See M 0134.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.
0335 BBC (Africa): Network Africa. Hilton Fyle and the team present information, personalities, and music.
0347 Christian Science Monitor (Africa, Middle East): Religious Article. See M 0147.

Tuesdays

0306 Christian Science Monitor: Home Forum. See M 2306.
0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0334 Christian Science Monitor: Letterbox. See M 0134.
0334 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.
0335 BBC (Africa): Network Africa. See M 0335.
0347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

0306 Christian Science Monitor: Curtain Call. See T 2306.
0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Discovery. An in-depth look at scientific research.
0334 Christian Science Monitor: Letterbox. See M 0134.
0334 Deutsche Welle: Insight. See T 1534.
0335 BBC (Africa): Network Africa. See M 0335.
0347 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

0306 Christian Science Monitor: Kaleidoscope. See W 2306.
0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: Sports Roundup. See 0315.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to bandits.
0334 Christian Science Monitor. Letterbox. See M 0134.
0334 Deutsche Welle: German By Radio. See S 0134.
0335 BBC (Africa): Network Africa. See M 0335.
0347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

0306 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.
0334 Christian Science Monitor: Letterbox. See M 0134.
0334 Deutsche Welle: Science And Technology. See M 0234.
0335 BBC (Africa): Network Africa. See M 0335.
0347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

0305 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett with past Top 20 pop music hits. This month: 1976, 1987, 1971, 1961, 1984.
0334 Deutsche Welle: Through German Eyes. See S 1513.
0335 BBC (Africa): Quiz Of The Week. The Saturday edition of "Focus On Africa," with a radio game show.

English language

shortwave guide

0400 UTC [12:00 PM EDT/9:00 PM PDT]

FREQUENCIES

0400-0415	Israel, Kol Israel	11588am			
0400-0425	Netherlands	6165na	9590na		
0400-0427	Czechoslovakia	5930na	7345na	9540na	
0400-0430	Bonaire, TWR Bonaire	9535am	11930am		
0400-0430	Bulgaria, Radio Sofia	9850eu	11720eu	15160eu	
0400-0430	Canada, RCI Montreal	9650eu	11905eu	15275me	15445me
0400-0430 varies	Croatian Radio via WHRI	7315na	9495na		
0400-0430	Cuba, RHC Havana	11950am	13710na		
0400-0430	Ecuador, HCJB Quito	9745am	15155am	21455am	
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0430 sm	Norway	9560na	11865na		
0400-0430	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
0400-0430	Tanzania	5985af	9685af	11765af	
0400-0430	Thailand	4830as	9655as	11905as	
0400-0430	United Kingdom,BBC London	3255af	3955eu	5975na	6180eu
		6190af	6195eu	7105af	7230eu
		7325na	9410eu	9600af	9610af
		9915na	11760me	15070va	15280as
		15310as	15420af	15590eu	17885af
0400-0430	United Kingdom,BBC London	6005af	6175am	11750va	11955me
		12095va	21715as		
0400-0450	Germany, Deutsche Welle	6130af	6145af	7150af	7225af
		9565af	9765af	11705af	11765af
		13610af	13770af		
0400-0450	North Korea	15180as	15230as	17765as	
0400-0500	Australia	15240pa	15365pa	17630as	17715pa
		17750as	17795pa	21525as	21740pa
		21775as			
0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0500	China, Radio Beijing	11680na	11840na		
0400-0500	Cook Islands	11760pa			
0400-0500	Costa Rica, RFPI	7375na	13630na	15030om	
0400-0500	Kenya, Voice of	4935do			
0400-0500	Luxembourg, RTL	15350va			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0400-0500	New Zealand, RNZI	17770pa			
0400-0500	Russia, Radio Moscow	11675va	11850va	11885na	11980va
		12040va	12050va	13645na	13665va
		15210va	15320va	15405va	15425va
		15470va	15550va	17570va	17860va
		17870va	17890va	21690va	21775va
0400-0500	Sierra Leone, SLBS	3316do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0500	South Africa, Radio RSA	5960af	9695af		
0400-0500 vl	South Africa,Radio Oranje	3215do			
0400-0500	USA, CSMonitor Boston	9455am	9840af	9870na	13760na
		17780as			
0400-0500 sa	USA, CSMonitor Boston	17555as			
0400-0500	USA, KTBN Salt Lake City	7510am			
0400-0500	USA, KVOH Los Angeles	9785am			
0400-0500	USA, VOA Washington	5995eu	6035me	6040me	6140me
		7170eu	7200eu	7265me	7280me
		7405me	9575me	9715eu	11835me
		15115me	15205me		
0400-0500	USA, WHRI Noblesville	7315na	9495sa		
0400-0500	USA, WJCR Upton, Kentucky		7490na		
0400-0500 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0400-0500	USA, WRNO New Orleans	7395am			
0400-0500	USA, WWCR Nashville	5920na	7435na		
0400-0500	USA, WYFR Okeechobee, FL		5985am	9505am	
0415-0440	Italy, RAI, Rome	7275me	9575me		
0430-0500	Cuba, RHC Havana	11760na	11950na		
0430-0500	Nigeria	3326do	4770do		
0430-0500	Swaziland, TWR Swaziland	5055af	5965af	7215af	9655af
		11750af			
0430-0500	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7230eu
		9410eu	9600af	11760me	12095va
		15070va	15280as	15310as	15400af
		15420af	15590eu	21470af	21715as
0430-0500	USA, VOA Washington	5995me	6040me	6140me	7170me
		7200me	7265me	9715me	11815me
0445-0500 t	Sri Lanka B'Casting Svc	9720am	15425am		
0455-0600	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

0400 Radio Norway Int'l: Norway Today. See S 0000.
0405 CSM: Herald Of Christian Science. See S0005.
0405 Swiss Radio Int'l: Grapevine. See S 0005.
0409 Deutsche Welle: Commentary. See S 0109.
0413 Deutsche Welle: Sports Report. See S 0213.
0415 BBC: Leading African women singers (through Nov. 8th).
0418 Swiss Radio Int'l: Shortwave Merry-Go-Round. See S 0018.
0419 Deutsche Welle: International Talking Point. Round-table.
0430 BBC (Africa): African Perspective. Major issues.
0430 BBC (Europe): Europe This Weekend. News and features.
0430 BBC: Short Story. This month's selections: "A Gift For The Emperor Dwarf" (11th); "Monkeys" (18th); "Laugh For Me" (25th) (except 4th: Seeing Stars, astronomy).
0434 Deutsche Welle (Africa): People And Places.
0445 BBC: Talks. Ghosts around the UK feature in "Encounters WithThe Unknown" (through November 1st).

Mondays

0400 Radio Norway Int'l: Norway Today. See S 0000.
0405 Christian Science M(am): Sunday Service. See S1605.
0405 Swiss Radio Int'l: Feature. See S 0605.
0406 CSM(Africa, Asia): News Features. See M 0006.
0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC (Africa): Network Africa. See M 0335.
0415 BBC: Talks. New-look Victoria and Albert Museum. "Behind The Glass Case" (through November 9th).
0430 BBC (Europe): Europe Today. News for the new Europe.
0430 BBC: Off The Shelf. Serialized readings from famous books. This month: Jane Austen's classic "Mansfield Park" (1st-23rd); Patrick White's novel "Voss" (26th-30th).
0434 Deutsche Welle: Africa In The German Press.
0445 BBC: Andy Kershaw's World Of Music. Exotic world music.

Tuesdays

0405 Swiss Radio Int'l: Dateline. See M 0605.
0406 Christian Science Monitor: News Features. See M0006.
0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC (Africa): Network Africa. See M 0335.
0415 BBC: Health Matters. See T 0145.
0430 BBC (Europe): Europe Today. See M 0430.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. Reports and background.
0445 BBC: Talks. See M 2315.

Wednesdays

0405 Swiss Radio Int'l: Dateline. See M 0605.
0406 Christian Science Monitor: News Features. See M 0006.
0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC (Africa): Network Africa. See M 0335.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0425 BBC: Book Choice. Review of a recently released book.
0430 BBC (Europe): Europe Today. See M 0430.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: Country Style. See W 0145.

Thursdays

0405 Swiss Radio Int'l: Dateline. See M 0605.
0406 Christian Science Monitor: News Features. See M 0006.
0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC (Africa): Network Africa. See M 0335.
0415 BBC: The Farming World. See H 0145.
0430 BBC (Europe): Europe Today. See M 0430.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0405 Swiss Radio Int'l: Dateline. See M 0605.
0406 CSM: News Features And Interviews. See M 0006.
0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC (Africa): Network Africa. See M 0335.
0415 BBC: Feature. See M 0145.
0430 BBC (Europe): Europe Today. See M 0430.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

0405 CSM: Herald Of Christian Science. SeeS 0005.
0405 Swiss Radio Int'l: Dateline. See M 0605.
0409 Deutsche Welle: Commentary. See S 0109.
0415 BBC (Africa): Midweek. Discussion of events from the week.
0415 BBC: Good Books (except 24th: A Month In The Country). See W1445.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC (Europe): Europe Today. See M 0430.
0430 BBC: Jazz Now And Then. See A 0145.
0434 Deutsche Welle: Man And Environment. See T 0234.
0445 BBC: Worldbrief. See F 2315.

English language

shortwave guide

0500 UTC [1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0510	Lesotho, Maseru	4800do			
0500-0510 w	Malawi B'casting Corp.	3381do			
0500-0515 t	Sri Lanka B'Casting Svc	9720am	15425am		
0500-0530	Cameroon CRTV Beau	3970do			
0500-0530	Swaziland, TWR Swaziland	5965af	9655af	11750af	
0500-0530	United Kingdom,BBC London	3255af	3955eu	6005af	6180as
		6190af	6195eu	7120eu	9410eu
		9600af	9640na	11760me	12095va
		15070as	15310as	15400af	15420af
		15590va	17885af	21470af	21715as
0500-0530	United Kingdom,BBC London	5975na	15280as	15575as	
0500-0530	Vatican Radio	7250eu	11625af	15090af	17730af
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na	9670na
		11705na	11925na	13610na	13790na
0500-0600	Australia	15240pa	15320pa	15365pa	17630as
		17715pa	17750as	17795pa	21525as
		21740pa	21775as		
0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, Radio Beijing	11840am			
0500-0600	Cook Islands	11760pa			
0500-0600	Costa Rica, RFPI	7375na	13630na	15030na	
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 sa	Eq.Guinea, R.East Africa	9585af			
0500-0600 varies	Italy, IRRS Milan, Italy	7125eu			
0500-0600	Japan NHK	11870na	15195na	15230na	17765na
		17810na	17825na	17890na	21610na
0500-0600	Kenya, Voice of	4935do			
0500-0600	Luxembourg, RTL	15350va			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0500-0600	New Zealand, RNZI	17770pa			
0500-0600	Nigeria	3326do	4770do	4990do	7255af
0500-0600	Russia, Radio Moscow	11885va	11980va	12050va	12060va
		13645va	13665va	15405va	15425va
		15550va	17560va	17605va	17890va
0500-0600	Sierra Leone, SLBS	3316do			
0500-0600	Singapore, SBC1	5052do	11940do		
0500-0600	South Africa, Radio RSA	9695af			
0500-0600	Spanish National Radio	9530na			
0500-0600	Thailand	4830as	9655as	11905as	
0500-0600	USA, CSMonitor Boston	9455na	9840af	9870na	13760na
		17780as			
0500-0600 sa	USA, CSMonitor Boston	17555as			
0500-0600	USA, KTBN Salt Lake City	7510am			
0500-0600	USA, KVOH Los Angeles	9785am			
0500-0600	USA, VOA Washington	5995eu	6035me	6040me	6060eu
		6140me	6873eu	7170me	7200me
		7405me	9575me	9670me	9700eu
		9715me	11815me	11825me	11850me
		15115me	15205me		
0500-0600	USA, WHRI Noblesville	7315na			
0500-0600	USA, WINB Red Lion, Penn.	15145eu			
0500-0600	USA, WJCR Upton, Kentucky		7490na		
0500-0600 mtwhfa	USA, WMLK Bethel, Penna.	9465eu			
0500-0600	USA, WWCR Nashville	5920na	7435na		
0500-0600	USA, WYFR Okeechobee, FL	5985am	9850eu	11580am	11915eu
		13695am	15565am		
0510-0515	Botswana, Gaborone	5955af	7255af		
0510-0600 vl	South Africa,Radio Oranje	9630do			
0518-0559 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775me	17840me		
0520-0530	Finland, YLE	6120va	9665va	11755va	15440va
0524-0600 f	Ghana, Radio 2, Accra	3366do			
0525-0600	Ghana, Radio 1, Accra	4915do			
0530-0600	Austria, ORF Vienna	6015na	6155eu	13730eu	21490me
0530-0600	Cameroon CRTV Yaounde	4850do			
0530-0600	Romania, R.Romania Int'l	15340af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	Swaziland, TWR Swaziland	5965af	11750af		
0530-0600	UAE Radio, Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180as	6190af	6195eu	7120eu
		9410eu	9600af	9640na	11760me
		12095va	15070as	15280as	15310as
		15400af	15420af	15575af	21470af
		21715as			
0545-0600	Cameroon CRTV Beau	3970do			

SELECTED PROGRAMS

Sundays

0505 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0509 Deutsche Welle: Commentary. See S 0109.
0517 Deutsche Welle: Feature. See S 0117.
0534 Deutsche Welle: German By Radio. See S 0134.

Mondays

0506 Christian Science Monitor (Africa, Asia): Encore. See M 0106.
0509 Deutsche Welle: Commentary. See S 0109.
0516 Deutsche Welle: Living In Germany. See M 0116.
0534 Christian Science Monitor (Africa, Asia): Letterbox. See M 0134.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.
0547 Christian Science Monitor (Africa, Asia): Religious Article. See M 0147.

Tuesdays

0506 Christian Science Monitor: Home Forum. See M 2306.
0509 Deutsche Welle: European Journal. See M 0209.
0534 Christian Science Monitor: Letterbox. See M 0134.
0547 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

0506 Christian Science Monitor: Curtain Call. See T 2306.
0509 Deutsche Welle: European Journal. See M 0209.
0534 Christian Science Monitor: Letterbox. See M 0134.

Thursdays

0506 Christian Science Monitor: Kaleidoscope. See W 2306.
0509 Deutsche Welle: European Journal. See M 0209.
0534 Christian Science Monitor: Letterbox. See M 0134.
0547 Christian Science Monitor: Religious Article. See M 0147.

Fridays

0506 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
0509 Deutsche Welle: European Journal. See M 0209.
0534 Christian Science Monitor: Letterbox. See M 0134.
0547 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

0505 Christian Science Monitor: Herald Of Christian Science. See S 0005.
0509 Deutsche Welle: European Journal. See M 0209.
0534 Deutsche Welle: Through German Eyes. See S 1513.

0600 UTC [2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0610 s	Malawi B'casting Corp.	3381do			
0600-0625	Cameroon CRTV Yaounde	4850do			
0600-0625	Kenya, Voice of	4935do			
0600-0630	Laos, National Radio of	7116as			
0600-0630 s	Latvia, Radio Riga	5935eu			
0600-0630	Swiss Radio Int'l	15430af	17565af	21770af	
0600-0630	United Kingdom,BBC London	3955eu	6180eu	6190af	6195eu
		7230eu	9410eu	9600af	11760me
		11940af	11955as	12095eu	15070va
		15310as	15400af	15420af	15590va
		17790as	17830as	17885af	21470af
		5975na	7150pa	9640va	15280as
		15360pa	15575as	21715as	
0600-0630	Vatican Radio	6245eu	7250eu		
0600-0640 last a	Lithuania, RadioCentras	9710eu			
0600-0645 s	Cameroon CRTV Douala	4795do			
0600-0650	Germany, Deutsche Welle	11780af	13610af	13790af	15185af
		15205af	17875af		
0600-0650	North Korea	15180as	15230as		
0600-0700	Australia	11720pa	15240pa	15320pa	15365pa
		17630as	17715pa	17750as	17795pa
		17880pa	21525as	21590pa	21740pa
		21775as			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Cook Islands	11760pa			
0600-0700	Costa Rica, RFPI	7375na	13630am	15030na	
0600-0700 West NA	Cuba, RHC Havana	11760na			
0600-0700	Czechoslovakia	6055va	7345va	9505va	11990va
0600-0700	Ecuador, HCJB Quito	11925am	21455am		
0600-0700 sa	Eq.Guinea, R.East Africa	9585af			
0600-0700	Ghana, Radio 1, Accra	4915do			
0600-0700 f	Ghana, Radio 2, Accra	3366do			
0600-0700 varies	Italy, IRRS Milan, Italy	7125eu			
0600-0700	Lebanon, King of Hope	6280me			
0600-0700	Luxembourg, RTL	15350va			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V. of the Medit.	9765eu			
0600-0700	New Zealand, RNZI	17770pa			
0600-0700 s	New Zealand, ZLXA	3935do			
0600-0700	Nigeria	3326do	4990do	7255af	
0600-0700	Russia, AWR Russia	11855as			
0600-0700	Russia, Radio Moscow	9855va	11730va	11765va	11880va
		11885va	11950va	12035va	12050va
		12055va	13645va	15125va	15225va
		15405va	15425va	15550va	17560va
		17605va	17635va	17890va	21690va
0600-0700	Sierra Leone, SLBS	3316do			
0600-0700	Singapore, SBC1	5010do	5052do	11940do	
0600-0700	South Africa, Radio RSA	15220af			
0600-0700 vl	South Africa,Radio Oranje	9630do			
0600-0700	South Korea, Seoul	7275om	11810na	15170na	
0600-0700	Swaziland, TWR Swaziland	5965af	7200af	11750af	
0600-0700 sa	Thailand	4830as	9655as	11905as	
0600-0700	USA, CSMonitor Boston	9455na	9840eu	9870am	17555as
		17780as			
0600-0700	USA, KTBN Salt Lake City	7510na			
0600-0700	USA, KVOH Los Angeles	9785na			
0600-0700	USA, VOA Washington	3980eu	5995eu	6040eu	6060me
		6110eu	6140eu	6873eu	7170me
		7325me	11805me	11815me	11825me
		11915me	15205me		
		6035af	6125af	7405af	9530af
		9575af	15115af	17715af	
0600-0700	USA, WHRI Noblesville	7315eu	9495am		
0600-0700	USA, WJCR Upton, Kentucky		7490na		
0600-0700 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0600-0700	USA, WWCR Nashville	5920na	7435na		
0600-0700	USA, WYFR Okeechobee, FL	5985am	7355eu	9680eu	11725na
		13695af	15565am		
0603-0610 tent	Croatian Radio, Zagreb	6210eu	9830eu	13830eu	
0615-0630 s	Cameroon CRTV Bertoua	4750do			
0615-0630	South Korea World News	7550eu	15575me		
0625-0700	Kenya, Voice of	4935do			
0630-0635 mtwhf	Congo, RTV Congolaise	7105do	9610do		
0630-0655	Belgium, BRT Brussels	5910au	11695eu		
0630-0700	Austria, ORF Vienna	6015na			
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	United Kingdom,BBC London	5975na	6180eu	6190af	6195eu
		7230eu	9410eu	9600af	9640pa
		11760me	11940af	11955as	12095eu
		15070va	15310as	15400af	15420af
		15590va	17830as	17885af	21470af
		7150pa	15280as	15360pa	17790as
		21715as			
0630-0700	Vatican Radio	11625af	15090af	17730af	
0635-0700	Monaco, TWR Monaco	9480eu			
0645-0700	Finland, YLE	6120eu	9560af	11755eu	
0645-0700	Ghana B'casting Corp.	6130af			
0645-0700	Romania, R.Romania Int'l	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		

SELECTED PROGRAMS

Sundays

0605 BBC (Africa): Postmark Africa. See S 0335.
0605 CSM: Herald Of Christian Science. SeeS 0005.
0605 Swiss Radio Int'l: Rotating features. "Supplement" (news analysis), "Roundabout Switzerland"(travel/discovery), "Swiss Music," and "The Name Game" (Swiss game show).
0609 Deutsche Welle: Commentary. See S 0109.
0613 Deutsche Welle: Sports Report. See S 0213.
0615 BBC: Letter From America. Alistair Cooke on the USA.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC (Africa): African Perspective. See S 0430.
0630 BBC: Jazz For The Asking. Listener requests.
0634 Deutsche Welle: People And Places. See S 0434.

Mondays

0605 Swiss Radio Int'l: Dateline. Analysis on world events and acloser look at the Swiss national fabric.
0606 CSM: News Features And Interviews. SeeM 0006.
0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: Recording Of The Week. A new classical release.
0630 BBC: Feature. See S 1401.
0634 Deutsche Welle: Africa In The German Press. See M 0434.
0635 BBC (Africa): Network Africa. See M 0335.

Tuesdays

0605 Swiss Radio Int'l: Dateline. See M 0605.
0606 CSM:News Features And Interviews. See M 0006.
0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Rock/Pop Music. Hear the rhythms of Latin American dance music in "Dance Roots"(6th); "West Coast Sound" looks at California's vibrant rock-music scene (through November 3rd).
0634 Deutsche Welle: Africa Report. See T 0434.
0635 BBC (Africa): Network Africa. See M 0335.

Wednesdays

0605 Swiss Radio Int'l: Dateline. See M 0605.
0606 CSM:News Features And Interviews. See M 0006.
0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. Events in the world of the arts.
0634 Deutsche Welle: Africa Report. See T 0434.
0635 BBC (Africa): Network Africa. See M 0335.

Thursdays

0605 Swiss Radio Int'l: Dateline. See M 0605.
0606 CSM: News Features And Interviews. See M 0006.
0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Sports International. See H 0230.
0634 Deutsche Welle: Africa Report. See T 0434.
0635 BBC (Africa): Network Africa. See M 0335.

Fridays

0605 Swiss Radio Int'l: Dateline. See M 0605.
0606 CSM:News Features And Interviews. See M 0006.
0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: Africa Report. See T 0434.
0635 BBC (Africa): Network Africa. See M 0335.

Saturdays

0605 BBC (Africa): Quiz Of The Week. See A 0335.
0605 CSM:Herald Of Christian Science. SeeS 0005.
0605 Swiss Radio Int'l: Grapevine. See S 0005.
0609 Deutsche Welle: Commentary. See S 0109.
0615 BBC: The World Today. See M 1645.
0618 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
0623 Deutsche Welle: Panorama. See A 0223.
0630 BBC (Africa): Spice Taxi. A look at African culture, from presidential style to cult films.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: Man And Environment. See T 0234.

0700 UTC 3:00 AM EDT/12:00 AM PDT]

0700-0710	Cameroon CRTV Bafoussam	4000do				
0700-0710 w	Malawi B'casting Corp.	3381do	5995do			
0700-0715	Romania, R.Romania Int'l	11810au	11940au	15335au	17720au	
		17805au	21665au			
0700-0730	Australia	15170pa	15240pa	15320va	15365pa	
	17630as 17715pa	17750as	17795pa	21525as	21740pa	
	21775as					
0700-0730	United Kingdom,BBC London	5975na	7150pa	9640va	11955as	
	15280as 15360pa	21715as	6180eu	6190af	6195eu	
	7230eu 7325af	9410eu	9760eu	11760me	11940af	
	12095eu 15070eu	15310as	15400af	15420af	15575as	
	17640va 17790as	17885af	21470af	21660af		
0700-0750	North Korea	15350as	17765as			
0700-0800	Canada, CFCX Montreal	6005do				
0700-0800	Canada, CFRX Toronto	6070do				
0700-0800	Canada, CFVP Calgary	6030do				
0700-0800	Canada, CHNX Halifax	6130do				
0700-0800	Canada, CKZU Vancouver	6160do				
0700-0800	Cook Islands	11760pa				
0700-0800	Costa Rica, RFPI	7375na	15030na			
0700-0800	West NA Cuba, RHC Havana	11760na				
0700-0800	Ecuador, HCJB Quito	11730eu	15270eu	21455eu		
0700-0800 sa	Eq.Guinea, R.East Africa	9585af				
0700-0800	Ghana B'casting Corp.	6130af				
0700-0800	Ghana, Radio 1, Accra	4915do				
0700-0800 f	Ghana, Radio 2, Accra	3366do				
0700-0800 varies	Italy, IRRS Milan, Italy	7125eu				
0700-0800	Japan NHK	15250me	17765eu	17810as	17860as	
		21525as				
0700-0800	Kenya, Voice of	4935do				
0700-0800	Lebanon, King of Hope	6280me				
0700-0800 tent	Liberia, ELBC Monrovia	7275do				
0700-0800	Luxembourg, RTL	15350va				
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do				
0700-0800	Malaysia, Voice of	6175as	9750as	15295as		
0700-0800	Monte Carlo, TWR	9480eu				
0700-0800	New Zealand, RNZI	17770pa				
0700-0800 smtwhf	New Zealand, ZXLA	3935do				
0700-0800	Nigeria	3326do	4990do			
0700-0800	Russia, Radio Moscow	4740va	4950va	4975va	5960va	
	7130va 7160va	7310va	9855va	11705va	11765va	
	11880va 11975va	12010va	12055va	13705va	15280va	
	15295va 15345va	15350va	15375va			
0700-0800	Sierra Leone, SLBS	3316do				
0700-0800	Singapore, SBC1	5010do	5052do	11940do		
0700-0800 vl	South Africa,Radio Oranje	9630do				
0700-0800	Swaziland, TWR Swaziland	7200af	11750af			
0700-0800	Taiwan, V. of Free China,	5950na				
0700-0800 sa	Thailand	4830as	9655as	11905as		
0700-0800	USA, CSMonitor Boston	9445na	9840eu	9870am	17555as	
		17780as				
0700-0800	USA, KTBN Salt Lake City	7510na				
0700-0800	USA, KVOH Los Angeles	9785na				
0700-0800	USA, WHRI Noblesville	7315eu				
0700-0800	USA, WJCR Upton, Kentucky		7490na			
0700-0800 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0700-0800	USA, WWCR Nashville	5920am	7435am			
0700-0800	USA, WYFR Okeechobee, FL	9850af	11915af	13695eu	15566na	
0703-0800 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0705-0800 a	Cameroon CRTV Douala	4795do				
0730-0745 mtwhf	Icelandic National Radio	9265om				
0730-0745 mtwhfa	Vatican Radio	6245do	7250do	9645na	15210na	
0730-0800	Australia	11880pa	15170va	15240pa	15320va	
	15365pa 17630as	17715pa	17750as	17795pa	21525as	
	21775as					
0730-0800	Czechoslovakia	17725pa	21705as			
0730-0800	Ecuador, HCJB Quito	9745au	11730eu	11925au	15270eu	
		21455va				
0730-0800	Netherlands	9630pa	11895pa			
0730-0800	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu	
	9600af 9760eu	11760me	11860af	11940af	12095va	
	15070eu 15105af	15400af	15420af	15590af	17640va	
	17830as 17885af	21470af	21660af	7150pa	9640va	
	11955as 15280as	15310as	15360pa	17790as	21715as	

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0803 daily	Croatian Radio, Zagreb	6210eu	9830	21480eu		
0800-0810	Cameroon CRTV Bafoussam		4000do			
0800-0810 w	Malawi B'casting Corp.	3381do				
0800-0825	Finland, YLE	17800as	21550as			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as		
0800-0825	Netherlands	9630pa	11895pa			
0800-0825	Swaziland, TWR Swaziland	7200af	11750af			
0800-0830	Australia	6080pa	15240pa	17630as	17715pa	
		17750as	21725as			
0800-0830	Ecuador, HCJB Quito	9745au	11730eu	11925au	21455va	
0800-0830	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu	
	9600af 9760eu	11760me	11860af	12095eu	15070eu	
	15310as 15360pa	15400af	15420af	15590me	17790as	
	17830as 17885af	21470af	21660af	7150pa	9640pa	
	9660eu 11950af	11955as	15105af	15280as	17640va	
	21715as					
0800-0835	Monte Carlo, TWR	9480eu				
0800-0845	Pakistan	17902eu	21520eu			
0800-0850	North Korea	15180as	15230as			
0800-0900	Australia, ABC Brisbane	9660do				
0800-0900	Australia, ABC Perth	15425va				
0800-0900 a	Cameroon CRTV Douala	4795do				
0800-0900	Canada, CFCX Montreal	6005do				
0800-0900	Canada, CFRX Toronto	6070do				
0800-0900	Canada, CFVP Calgary	6030do				
0800-0900	Canada, CHNX Halifax	6130do				
0800-0900	Canada, CKZU Vancouver	6160do				
0800-0900	Cook Islands	11760pa				
0800-0900	Costa Rica, RFPI	7375na	15030na			
0800-0900 sa	Eq.Guinea, R.East Africa	9585af				
0800-0900	Ghana, Radio 1, Accra	4915do				
0800-0900 f	Ghana, Radio 2, Accra	3366do				
0800-0900 asmtwh	Guam, KTWR Guam	15200as				
0800-0900	Indonesia, Voice of	7125as	9675as	11752as	11785as	
0800-0900 varies	Italy, IRRS Milan, Italy	7125eu				
0800-0900	Kenya, Voice of	4935do				
0800-0900	Lebanon, King of Hope	6280me				
0800-0900	Luxembourg, RTL	15350va				
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do				
0800-0900	New Zealand, RNZI	9700pa				
0800-0900 smtwhf	New Zealand, ZXLA	3935do				
0800-0900	Nigeria	3326do	4990do			
0800-0900	Nigeria, Voice of	7255af				
0800-0900	Papua New Guinea	4890do				
0800-0900	Russia, Radio Moscow	4740va	4940va	4975va	5960va	
	7130va 7160va	7310va	9535va	11705va	11765va	
	11920va 11975va	12010va	12055va	13705va	15295va	
	15345va 15350va	15420va	15435va			
0800-0900	Sierra Leone, SLBS	3316do	5980do			
0800-0900	Singapore, SBC1	5010do	5052do	11940do		
0800-0900 vl	South Africa,Radio Oranje	9630do				
0800-0900	South Korea, Seoul	7550eu	13670eu			
0800-0900	USA, CSMonitor Boston	9445am	11705eu	13615as	15665pa	
		17555as				
0800-0900	USA, KNLS Anchor Point	7365as				
0800-0900	USA, KTBN Salt Lake City	7510am				
0800-0900	USA, VOA Washington	11735eu	15160eu	15195me	21455me	
		21570me				
0800-0900	USA, WHRI Noblesville	7315eu	7355sa			
0800-0900	USA, WJCR Upton, Kentucky		7490na			
0800-0900 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0800-0900	USA, WWCR Nashville	692am	5920na			
0803-0810 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0803-0900 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0830-0845	Vatican Radio	6245eu	7250eu	9645eu	15210eu	
0830-0900	Australia	6080pa	9580pa	9710va	15240pa	
		17630as	17750as	21725as	21775as	
0830-0900	Austria, ORF Vienna	6155eu	13730eu	15450au	21490as	
0830-0900	Ecuador, HCJB Quito	9745au	11925au	15270eu	21455au	
0830-0900	Finland, YLE	15355as	17800as			
0830-0900	Italy, AWR Italy	7230eu				
0830-0900	Netherlands	9630pa	11895pa			
0830-0900	United Kingdom,BBC London	6180eu	6190eu	7325eu	9410eu	
	9660eu 9760eu	11860af	11940af	11955as	12095eu	
	15070va 15280as	15360pa	15400af	15420af	15590me	
	17640va 17830as	21660af	21715as	17885af		
0835-0850 mtwhf	Monaco, TWR Monaco	9480eu				
0835-0850 smtwhf	Monte Carlo, TWR	9480eu				
0835-0850 mtwhf	Swaziland, TWR Swaziland	7200af	11750af			
0850-0900 s	Monte Carlo, TWR	9480eu				

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0903 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0900-0905	Ghana, Radio 1, Accra	4915do				
0900-0905 f	Ghana, Radio 2, Accra	3366do				
0900-0910	Malawi B'casting Corp.	5995do				
0900-0912 f	Guam, KTWR Guam	15200as				
0900-0915	Lebanon, Radio Voice of	6550me				
0900-0915 s	Monte Carlo, TWR	9480eu				
0900-0925 mtwhf	Belgium, BRT Brussels	9905eu	13675eu			
0900-0925	Netherlands	9630pa	11895pa			
0900-0930	Costa Rica, RFPI	7375na	15030na			
0900-0930 asmtwf	Guam, KTWR Guam	15200as				
0900-0930 mtwhf	New Zealand, ZLXA	3935do				
0900-0930	Swiss Radio Int'l	9560as	13685as	17670as	21770as	
0900-0930	United Kingdom,BBC London	1170as	5975eu	6045eu	6180eu	
	6190af 6195as	7325eu	9410eu	9660eu	9740as	
	9750eu 9760eu	11760me	11860af	11940af	12095eu	
	15070va 15400af	17640va	21660af			
	15190sa 15280as	15310as	15360as	15420af	15575me	
	15590me 17705eu	17790af	17830as	17885af	21470af	
	21660af 21715as					
0900-0950	Germany, Deutsche Welle	6160as	9565af	11915as	15410af	
	17780as 17820as	21465as	21600af	21650as	21680as	
0900-1000	Australia	6080pa	9580pa	9710va	13605as	
		15170as	21725as			
0900-1000	Australia, ABC Brisbane	9660pa				
0900-1000 s	Bhutan Broadcasting Svc	6035do				
0900-1000	Canada, CFCX Montreal	6005do				
0900-1000	Canada, CFRX Toronto	6070do				
0900-1000	Canada, CFVP Calgary	6030do				
0900-1000	Canada, CHNX Halifax	6130do				
0900-1000	Canada, CKZU Vancouver	6160do				
0900-1000	China, Radio Beijing	8450au	11755au	15440au	17710au	
0900-1000	Cook Islands	11760pa				
0900-1000	Ecuador, HCJB Quito	9745au	11925au	21455au		
0900-1000 sa	Eq.Guinea, R.East Africa	9585af				
0900-1000	Guam, KTWR Guam	11805as				
0900-1000 s	Italy, AWR via Portugal	9670eu				
0900-1000 varies	Italy, IRRS Milan, Italy	7125eu				
0900-1000	Japan NHK	15270au	17890au			
0900-1000	Japan NHK	11840as	21610as			
0900-1000	Kenya, Voice of	4935do				
0900-1000	Lebanon, King of Hope	6280me				
0900-1000	Luxembourg, RTL	15350va				
0900-1000	Malaysia, RTM Radio 4	7295do				
0900-1000	New Zealand, RNZI	9700pa				
0900-1000	Nigeria	3326do	4990do			
0900-1000	Nigeria, Voice of	7255af				
0900-1000	Papua New Guinea	4890do				
0900-1000	Philippines, FEBC Manila	9800as	11685as			
0900-1000	Russia, Radio Moscow	4740do	4940do	4975do	6000am	
	7130am 7245va	9535va	9780va	9855va	11705va	
	11765va 11920va	11975va	12055va	13705va	15175va	
	15280va 15295va	15345va	15545na			
0900-1000	Sierra Leone, SLBS	3316do				
0900-1000	Singapore, SBC1	5010do	5052do	11940do		
0900-1000 vl	South Africa,Radio Oranje	9630do				
0900-1000	Tanzania	5985af	9685af	11765af		
0900-1000	USA, CSMonitor Boston	9445am	11705eu	13615pa	15665pa	
		17555as				
0900-1000	USA, KTBN Salt Lake City	7510am				
0900-1000	USA, VOA Washington	11735eu	15160eu	15195me	21455me	
		21570eu				
0900-1000	USA, WJCR Upton, Kentucky		7490na			
0900-1000 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0900-1000	USA, WWCR Nashville	5920am	7435am			
0905-1000	Cameroon CRTV Yaounde	4850do				
0905-1000 sa	Ghana, Radio 1, Accra	4915do				
0905-1000 mtwhf	Ghana, Radio 2 School prg	7295do				
0905-1000 sa	Ghana, Radio 2, Accra,	3366do				
0910-0940 smwha	Mongolia, Ulaanbaatar	11850pa	12015pa			
0915-0930	South Korea World News	9570am	13670eu			
0930-1000	Afghanistan, Kabul	9635as				
0930-1000	Netherlands	9630pa	11895pa			
0930-1000	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af	
	6195as 9410eu	9660eu	9740as	9750eu	9760eu	
	11750as 11760me	11940af	12095eu	15070va	15310as	
	15400af 15420af	15575me	15590me	15190sa	17640va	
	17705eu					
0940-0950	Greece, Voice of	17525eu				
0950-0953 a	Russia, Vladivostok	4050do	4485do	5015do	5905do	
	6035do 6175pa	7175pa	7210pa	7260pa	7270pa	
	7345pa 9530pa	9600pa	9635pa	9825pa	9905pa	
	11815pa 15535pa	15595pa	17620pa	17695pa	17825pa	
	17850pa					

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1025	Netherlands	9630pa	11895pa		
1000-1030 tent	Afghanistan, Kabul	9635as			
1000-1030	Israel, Kol Israel	17545eu			
1000-1030	Tanzania	5985af	9685af	11765af	
1000-1030	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
	6195as 9410eu	9660eu	9740as	9750eu	9760eu
	11750as 11760me	11940af	12095eu	15070va	15190sa
	15310as 15400af	15420af	15575me	17640eu	17705eu
	17790af 17885af	21470af	21660af	21715as	
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1000-1100	Australia	6080pa	9580pa	9710va	11880pa
		13605pa	21725as		
1000-1100	Cameroon CRTV Yaounde	4850do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, Radio Beijing	8450au	11755au	15440au	17710au
1000-1100	Cook Islands	11760pa			
1000-1100	Costa Rica, AWR	9725ca			
1000-1100	Costa Rica, RFPI	7375na	15030na		
1000-1100	Ecuador, HCJB Quito	9745au	11925au	21455au	
1000-1100 sa	Eq.Guinea, R.East Africa	9585af			
1000-1100 sa	Ghana, Radio 1, Accra	4915do			
1000-1100 mtwhf	Ghana, Radio 2 School Prg	7295do			
1000-1100 sa	Ghana, Radio 2, Accra	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1100 varies	Italy, IRRS Milan, Italy	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100	Luxembourg, RTL	15350va			
1000-1100	Malaysia, RTM Kuching	7160do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, RNZI	9700pa			
1000-1100	Nigeria	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11665as		
1000-1100	Russia, Radio Moscow	9455na	9495na	11840na	15485na
1000-1100	Sierra Leone, SLBS	3316do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1100	South Africa, Radio RSA	11900af			
1000-1100 vl	South Africa,Radio Oranje	9630do			
1000-1100	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1000-1100 sa	USA, CSMonitor Boston	15665me			
1000-1100	USA, VOA Washington	5985as	11720au	15425au	
1000-1100	USA, WHRI Noblesville	7315na			
1000-1100	USA, WJCR Upton, Kentucky		7490na		
1000-1100	USA, WWCR Nashville	5920am	15690na		
1000-1100	USA, WYFR Okeechobee, FL		5950am		
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Czechoslovakia	6055va	7345va	9505va	11990va
1030-1100	Iran, Islamic Republic	9525as	11715af	11790as	11910as
		11930me			
1030-1100	South Korea, Seoul	11715na			
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100 sa	Tanzania	5985af	9685af	11765af	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1030-1100	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
	6195as 9410eu	9660eu	9740as	9750eu	9760eu
	11750as 11760me	11940af	12095eu	15070va	15190sa
	15310as 15400af	15420af	15575me	17640va	17705eu
	17790af 17885af	21470af	21660af		
1040-1050	Greece, Voice of	15650as	17525as		
1055-1100	Bonaire, TWR Bonaire	11815am	15345am		

1100 UTC [7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1110 mtwhf	Ghana, Radio 2 School Prg	7295do			
1100-1110 sa	Malawi B'casting Corp.	5995do			
1100-1120	Pakistan	17902eu	21520eu		
1100-1130	Ecuador. HCJB Quito	9745au	11925au	15155au	21455au
1100-1130	Iran, Islamic Republic	9525af	11515af	11790as	11910as
		11930me			
1100-1130 irreg	Mozambique	9525af	11818af	11835af	
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1100-1130	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1100-1130	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15310as	15400af	15420af	15575me
		15220na	17640va	17705eu	17790af
		17885af	21470af	21660af	
1100-1130	Vietnam, Voice of	9840as	12020as	15010as	
1100-1150	Germany, Deutsche Welle	15410af	17765af	17800af	17860af
		21600af			
1100-1150	North Korea	6576na	9977na	11335na	
1100-1200	Australia	6020pa	6080pa	7240pa	9580pa
		9710va	11880pa	13605pa	21725as
1100-1200	Bonaire, TWR Bonaire	11815am	15345am		
1100-1200	Bulgaria, Radio Sofia	11630af			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Cook Islands	11760pa			
1100-1200	Costa Rica, AWR	9725ca	11870ca		
1100-1200	Costa Rica, RFPI	7375na	15030na		
1100-1200	Czechoslovakia	6055va	7345va	9505va	11990va
1100-1200	Ghana, Radio 1, Accra	4915do			
1100-1200 sa	Ghana, Radio 2, Accra	3366do			
1100-1200 varies	Italy, IRRS Milan, Italy	7125eu			
1100-1200	Japan NHK	6120na	11815sa	11840na	
1100-1200	Luxembourg, RTL	15350va			
1100-1200	Malaysia, RTM Kuching	4950do	7160do		
1100-1200	Malaysia, RTM Radio 4	7295do			
1100-1200	New Zealand, RNZI	9700as			
1100-1200	Russia, Radio Moscow	9600na	12055na	15485na	17830na
1100-1200	Singapore, SBC1	5010do	5052do	11940do	
1100-1200	South Africa, Radio RSA	11900af			
1100-1200 vl	South Africa,Radio Oranje	9630do			
1100-1200	South Korea World News	15575af			
1100-1200	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1100-1200 sa	USA, CSMonitor Boston	15665me			
1100-1200	USA, KTBN Salt Lake City	7510na			
1100-1200	USA, VOA Washington	5985as	6110au	9760as	11720au
		15155au	15425as	21640as	
1100-1200	USA, WHRI Noblesville	7315na	9465na		
1100-1200	USA, WJCR Upton, Kentucky		7490na		
1100-1200	USA, WWCR Nashville	12160na	15690na		
1100-1200	USA, WYFR Okeechobee, FL		5950am	7355am	
1115-1130	South Korea World News	7275as	11740as		
1115-1145	Nepal, Kathmandu	3230as	5005as	7165as	
1120-1130	Vatican Radio	6245do	7250do	9645do	15210do
1125-1130 sa	Botswana, Gaborone	5955af	7255af		
1125-1150 mtwhf	Finland, YLE	15400na			
1130-1140	Lesotho, Masseru	4800do			
1130-1155 s	Belgium, BRT Brussels	17555va	21810na		
1130-1200	Austria, ORF Vienna	6155eu	11780as	13730va	15450as
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1200	Italy, AWR Italy	7230eu			
1130-1200	South Korea, Seoul	9650na			
1130-1200	Thailand	4830as	9655as	11905as	
1130-1200	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		17640va	17705eu	17790af	17885af
		21470af			
1130-1200 WAR/var	Yugoslavia	17710as	17740am	21605pa	

SELECTED PROGRAMS

Sundays

1105 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1105 Swiss Radio Int'l: Feature. See S 0605.
1109 Deutsche Welle: Arts On The Air. Reports and interviews on cultural events and developments.
1130 BBC: The Ken Bruce Show. See S 0030.
1134 Deutsche Welle: German By Radio. See S 0134.

Mondays

1105 Swiss Radio Int'l: Dateline. See M 0605.
1106 Christian Science Monitor: Encore. See M 0106.
1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1130 BBC: Composer Of The Month. See M 0230.
1134 Christian Science Monitor: Letterbox. See M 0134.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.
1147 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

1105 Swiss Radio Int'l: Dateline. See M 0605.
1106 Christian Science Monitor: Home Forum. See M 2306.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1134 Christian Science Monitor: Letterbox. See M 0134.
1134 Deutsche Welle: Hello Africa. See M 1134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

1105 Swiss Radio Int'l: Dateline. See M 0605.
1106 Christian Science Monitor: Curtain Call. See T 2306.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Meridian. See W 0630.
1134 Christian Science Monitor: Letterbox. See M 0134.
1134 Deutsche Welle: Hello Africa. See M 1134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

1105 Swiss Radio Int'l: Dateline. See M 0605.
1106 Christian Science Monitor: Kaleidoscope. See W 2306.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Drama. Follow the plight of Arcos the sorcerer in "The Heart Of Hark 'un" (1st); Whodunit? It's Agatha Christie's "Sad Cypress" (through November 5th).
1134 Christian Science Monitor: Letterbox. See M 0134.
1134 Deutsche Welle: Hello Africa. See M 1134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Fridays

1105 Swiss Radio Int'l: Dateline. See M 0605.
1106 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Meridian. See W 0630.
1134 Christian Science Monitor: Letterbox. See M 0134.
1134 Deutsche Welle: Hello Africa. See M 1134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

1105 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1105 Swiss Radio Int'l: Grapevine. See S 0005.
1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1118 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.

1200UTC [8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1205	New Zealand, RNZI	9700as			
1200-1210 w	Malawi B'casting Corp.	3381do	5995do		
1200-1215	Cambodia, Voice of	9695as	11938as		
1200-1225 sa	Ghana, Radio 2, Accra	3366do			
1200-1230	Bulgaria, Radio Sofia	11630af			
1200-1230 smwha	Mongolia, Ulaanbaatar	11850as	12015as		
1200-1230 as	Norway	17860as	21705as		
1200-1230	Thailand	4830as	9655as	11905as	
1200-1230	United Kingdom,BBC London	6045eu	6180eu	6190af	6195eu
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1200-1230	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425as			
1200-1230	Uzbekhistan, R. Tashkent	5945as	9540as	15470as	17745as
1200-1255	Polish Radio Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Australia	6020pa	6080pa	7240pa	9580pa
		9710pa	21725as		
1200-1300	Australia, ABC Brisbane	4920au			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1300	Bonaire, TWR Bonaire	11815am	15345am		
1200-1300	Brazil, Radiobras	15445am			
1200-1300 mtwhf	Cameroon CRTV Douala	4795do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	17820am	
1200-1300	China, Radio Beijing	8425au	9665na	9715as	11600pa
		11660as	15450pa		
1200-1300	Cook Islands	11760pa			
1200-1300	Costa Rica, AWR	9725ca	11870ca		
1200-1300	Costa Rica, RFPI	13630na	15030na		
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300 sa	Eq.Guinea, R.East Africa	9585af			
1200-1300	Ghana, Radio 1, Accra	4915do			
1200-1300 varies	Italy, IRRS Milan, Italy	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Luxembourg, RTL	15350va			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300	Nigeria	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1300	Papua New Guinea	4890do			
1200-1300	Russia, Radio Moscow	9655na	9755na	11840na	11985na
		12050na	12055na	15280na	15485na
		17670na	17830na		
1200-1300	Sierra Leone, SLBS	3316do	5980do		
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1300 vl	South Africa,Radio Oranje	9630do			
1200-1300 sa	Tanzania	5985af	9684af	11765af	
1200-1300	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1200-1300 as	USA, CSMonitor Boston	15665eu			
1200-1300	USA, KTBN Salt Lake City	7510am			
1200-1300	USA, WHRI Noblesville	7315am			
1200-1300	USA, WJCR Upton, Kentucky		7490na		
1200-1300	USA, WWCR Nashville	12160na	15690na		
1200-1300	USA, WYFR Okeechobee, FL	5950am	6015am	11830am	17760am
1203-1210 as	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Seoul	9750am			
1226-1300	Ghana, Radio 2, Accra	7295do			
1230-1255 mtwhf	Finland, YLE	15400na	17880na		
1230-1300	Bangladesh	15200as	15605as	15647as	17750as
1230-1300	France, RFI Paris	9805eu	11670eu	15195eu	15365eu
		15425eu	21645na		
1230-1300	Netherlands	9855eu			
1230-1300	Sri Lanka B'casting Corp.	6075as	9720as		
1230-1300	Sweden	15170as	17740as		
1230-1300	United Kingdom,BBC London	6045eu	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	12170as	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1230-1300	USA, VOA Washington	6110as	9760au	11715au	15155as
		15425as			
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1235-1245	Greece, Voice of	15635na	15650na	17515na	

SELECTED PROGRAMS

Sundays

1200 Radio Norway Int'l: Norway Today. See S 0000.
1201 BBC: Play Of The Week. See S 0101.
1205 Christian Science Monitor: Herald Of Christian Science. See S 0005.

Mondays

1206 Christian Science Monitor: News Features And Interviews. See M 0006.
1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
1215 BBC: Quiz. Robert Robinson hosts the final of the general-knowledge game show "Brain Of Britain" (5th); the winner takes on previous Brains in "Brain Of Brains" (12th); "Screenplay" is a movie quiz (through December 7th).
1245 BBC: Sports Roundup. See S 0315.

Tuesdays

1206 Christian Science Monitor: News Features And Interviews. See M 0006.
1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1245 BBC: Sports Roundup. See S 0315.

Wednesdays

1206 Christian Science Monitor: News Features And Interviews. See M 0006.
1209 BBC: Words Of Faith. See M 1209.
1215 BBC: New Ideas. See M 1615.
1235 BBC: Talks. See M 1635.
1245 BBC: Sports Roundup. See S 0315.

Thursdays

1206 Christian Science Monitor: News Features And Interviews. See M 0006.
1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 2. See W 2330.
1245 BBC: Sports Roundup. See S 0315.

Fridays

1206 Christian Science Monitor: News Features And Interviews. See M 0006.
1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Feature. This month, hear "Colleges For Peace" (2nd); "La Serenissima" (9th); "Salem Witch Hunt: 1692" (16th); "Tutankhamen's Legacy" (23rd); "My One And Only" (30th).
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1200 Radio Norway Int'l: Norway Today. See S 0000.
1205 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 3. See F 2330.
1245 BBC: Sports Roundup. See S 0315.

1300 UTC [9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1315	South Korea, Seoul	9750na			
1300-1320	Brazil, Radiobras	15445am			
1300-1325	Belgium, BRT Brussels	17555va	21810na		
1300-1325	Kenya, Voice of	4935do			
1300-1325	Netherlands	9855eu			
1300-1330	Afghanistan, Kabul	9635as			
1300-1330	Bonaire, TWR Bonaire	11815am	15345am		
1300-1330 mtwhf	Cameroon CRTV Douala	4795do			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330 as	Finland, YLE	15400na	17880na		
1300-1330	Israel, Kol Israel	11587am	11605na	15590na	15640as
		15650as	17575eu	17590eu	
1300-1330 as	Norway	9590eu	15270af		
1300-1330	Swiss Radio Int'l	6165eu	7480as	9535eu	11690as
		12030eu	13635as	15505as	17670as
		21770as			
1300-1330	United Kingdom,BBC London	5965am	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	15220na	17640va	17705eu
		17790af	17840af	17885af	21470af
		21660af			
1300-1330	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425au			
1300-1350	North Korea	9325eu	9345eu	9640as	13650as
		13650am	15230as	15230am	
1300-1400	Australia	5995pa	6080pa	7240pa	9580pa
		11800pa			
1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955am	17820am		
1300-1400	China, Radio Beijing	9715as	11660va	11855na	
1300-1400	Cook Islands	11760pa			
1300-1400	Costa Rica, RFPI	13630na	15030na		
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1300-1400 sa	Eq.Guinea, R.East Africa	9585af			
1300-1400	Ghana, Radio 1, Accra	4915do			
1300-1400	Ghana, Radio 2, Accra	7295do			
1300-1400	Luxembourg, RTL	15350va			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1400	Papua New Guinea	4890do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R.Romania Int'l	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855as			
1300-1400	Russia, Radio Moscow	7370va	9655na	9755na	11840na
		11870va	11985na	11995va	12050na
		12055na	15485na	17670na	17830na
1300-1400	Sierra Leone, SLBS	3316do	5980do		
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1400 vl	South Africa,Radio Oranje	9630do			
1300-1400	Sri Lanka B'casting Corp.	6075as	9720as		
1300-1400 sa	Tanzania	5985af	9684af	11765af	
1300-1400	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1300-1400 as	USA, CSMonitor Boston	15665eu			
1300-1400	USA, KNLS Anchor Point	11580as			
1300-1400	USA, KTBN Salt Lake City	7510am			
1300-1400	USA, WHRI Noblesville	9465na	11790na		
1300-1400	USA, WJCR Upton, Kentucky		7490na		
1300-1400	USA, WWCR Nashville	12160na	15690		
1300-1400	USA, WYFR Okeechobee, FL		5950am	6015am	11550as
		11830am	13695na	17760am	
1315-1330	Lebanon, Radio Voice of	6549.5			
1320-1400	Jordan	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1345	South Korea World News	7275as	11740as		
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Austria, ORF Vienna	11780as	15450as		
1330-1400	Cameroon CRTV Douala	4795do			
1330-1400	Finland, YLE	15400na	17880na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400 a	Indonesia,Radio Republik	3385do	6070do		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands	17580pa	17605pa	21665pa	
1330-1400	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195ca	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	17640va	17705eu	17790af
		17840af	17885af	21470af	21660af
1330-1400	USA, VOA Washington	6110as	9760as	15155au	15425au
1330-1400	Uzbekhistan, R.Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican Radio	11640au	15090au	17525au	21515au

SELECTED PROGRAMS

Sundays

1300 Radio Norway Int'l: Norway Today. See S 0000.
1305 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1305 Swiss Radio Int'l: Feature. See S 0605.

Mondays

1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Encore. See M 0106.
1334 Christian Science Monitor: Letterbox. See M 0134.
1347 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Home Forum. See M 2306.
1334 Christian Science Monitor: Letterbox. See M 0134.
1347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Curtain Call. See T 2306.
1334 Christian Science Monitor: Letterbox. See M 0134.
1347 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Kaleidoscope. See W 2306.
1334 Christian Science Monitor: Letterbox. See M 0134.
1347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
1334 Christian Science Monitor: Letterbox. See M 0134.
1347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

1300 Radio Norway Int'l: Norway Today. See S 0000.
1305 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1305 Swiss Radio Int'l: Grapevine. See S 0005.
1318 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.

1400 UTC [10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1410	Malawi B'casting Corp.	3381do			
1400-1415	Vatican Radio	15090au	17525au	21515au	
1400-1425	Netherlands	17580pa	17605pa	21665pa	
1400-1430	Cameroon CRTV Douala	4795do			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1430	Malaysia, RTM Kuching	4950do			
1400-1430	United Kingdom,BBC London	6190af	6195af	6195as	7180as
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11820as
		11940af	12095eu	15070eu	15220na
		15310as	15575me	17640va	17705eu
		17790af	17840na	17880af	21470af
		21660af			
1400-1500	Australia	5995pa	6060pa	6080pa	7240pa
		9540pa	9580pa	9770va	11800na
		15170va			
1400-1500	Australia, VLW6 Wanneroo,	6140do			
1400-1500	Cameroon CRTV Yaounde	4850do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955am	17820am		
1400-1500	China, Radio Beijing	4200as	11815as	11855na	15165as
1400-1500	Cook Islands	11760pa			
1400-1500	Costa Rica, RFPI	13630na	15030am		
1400-1500	France, RFI Paris	11910as	17650as	17695as	
1400-1500	Ghana, Radio 1, Accra	4915do			
1400-1500	Ghana, Radio 2, Accra	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 varies	Italy, IRRS Milan, Italy	7125eu			
1400-1500	Japan NHK	9505am	11865va		
1400-1500	Jordan	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Luxembourg, RTL	15350va			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500	Malta, V. of the Medit.	11925eu			
1400-1500	Nigeria	4990do	7285do		
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	7370va	9655na	9675na	9755na
		11840na	11870va	11995na	12015va
		12030va	12050na	15435na	15485na
		15490va	15580va	17670na	17695va
		17810va	21690na		
1400-1500	Sierra Leone, SLBS	3316do	5980do		
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500 vl	South Africa,Radio Oranje	9630do			
1400-1500	South Korea, Seoul	9570as			
1400-1500	Sri Lanka B'casting Corp.	6075as	9720as		
1400-1500 sa	Tanzania	5985af	9684af	11765af	
1400-1500	USA, CSMonitor Boston	9530as	13625as	13760am	15665eu
		17555am			
1400-1500 sa	USA, CSMonitor Boston	13710na			
1400-1500	USA, KTBN Salt Lake City	7510na			
1400-1500	USA, VOA Washington	6110as	9760as	15160au	15425au
1400-1500	USA, WHRI Noblesville	9465na	15105na		
1400-1500	USA, WJCR Upton, Kentucky		7490na		
1400-1500	USA, WWCR Nashville	15690am	17535na		
1400-1500	USA, WYFR Okeechobee, FL	6015am	11550as	11830am	17760am
1405-1430	Finland, YLE	6120va	6155eu	9730af	11755eu
		11820va	15440me	17880eu	
1415-1425	Nepal, Kathmandu	3230do	5005do	7165do	
1415-1429	Canada, RCI Montreal	11935eu	15305eu	15315eu	15325eu
		17795eu	17820eu	21545eu	
1415-1500	Bhutan Broadcasting Svc	5023do			
1430-1500	Albania, Radio Tirana	7155eu	9760eu		
1430-1500 mtwhfa	Cameroon CRTV Douala	4795do			
1430-1500	Ecuador, HCJB Quito	11925am	17890am	21455am	
1430-1500	Iraq	15240as			
1430-1500	Myanmar, Voice of, Burma	5990do			
1430-1500	Netherlands	9890as	15150as	17605as	21665as
1430-1500	Romania, R.Romania Int'l	11775as	15335as	17720as	
1430-1500	United Kingdom,BBC London	6180eu	6190af	6195as	9410eu
		9515na	9740as	9750eu	9760eu
		11750as	11820as	11940af	12095eu
		15070va	15310as	15575me	17640va
		17705eu	17790af	17840va	17880af
1430-1500	United Kingdom,BBC London	7180as	21470af	21660af	
1445-1500 smwha	Mongolia, Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. This month, Philip Bacon and Sarah Dickinson double-team interviewees in "About Face."
1405 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1430 BBC: Anything Goes. Bob Holness presents a variety of music and other recordings.

Mondays

1400 BBC (East Asia): Dateline East Asia. The political and economic affairs of the Pacific rim.
1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1406 Christian Science Monitor: News Features And Interviews. See M 0006.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Talks. See S 0445.

Tuesdays

1400 BBC (East Asia): Dateline East Asia. See M 1400.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features And Interviews. See M 0006.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Feature. See M 0145.

Wednesdays

1400 BBC (East Asia): Dateline East Asia. See M 1400.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features And Interviews. See M 0006.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Good Books. Recommendations of books to read (except 28th: A Month In The Country, Michael Hayes' wanderings of rural Britain).

Thursdays

1400 BBC (East Asia): Dateline East Asia. See M 1400.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features And Interviews See M 0006.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Recording Of The Week. See M 0615.

Fridays

1400 BBC (East Asia): Dateline East Asia. See M 1400.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features And Interviews. See M 0006.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Global Concerns. See F 0145.

Saturdays

1401 BBC: John Peel. See T 0330.
1405 Christian Science Monitor: Herald Of Christian Science. See S 0005.
1430 BBC: Sportsworld. The latest soccer, cricket, tennis, golf, and more.

English language

shortwave guide

1500 UTC [11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1515 smwha	Mongolia, Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands	9890as	15150as	17605as	21665as
1500-1530 mtwhf	Portugal	21515me			
1500-1530	Romania, R.Romania Int'l	11775as	15335as	17720as	
1500-1530	Sweden	15270va	17870na	21500na	
1500-1530	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1500-1530 sa	Tanzania	5985af	9684af	11765af	
1500-1530	United Kingdom,BBC London	3915as	5975eu	6045eu	6180eu
		6190af	6195eu	6195as	9410eu
		9515na	9740na	9750eu	9760eu
		11750as	11940af	12095eu	15070va
		15310as	15400af	15420af	17840na
		15260na	15575me	17640va	17705eu
		17790af	17860af	17880af	21470af
		21490af	21660af		
1500-1550	Germany, Deutsche Welle	9735af	11965af	13610af	17735af
		17765af	21600af		
1500-1550	North Korea	9325eu	9640af	9977af	11705eu
1500-1555	Polish Radio Warsaw	7285eu	9525eu	11840eu	
1500-1555	Seychelles, FEBA	9810as	11685af	15330as	
1500-1600	Australia	5995pa	6060pa	6080pa	7240pa
		9540pa	9580pa	9770pa	11800pa
		12000pa	13755pa	15170as	17565as
1500-1600	Bangladesh	4880do			
1500-1600	Cameroon CRTV Yaounde	4850do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, Radio Beijing	7405na	11815as	15165as	
1500-1600	Cook Islands	11760pa			
1500-1600	Costa Rica, RFPI	13630na	15030am		
1500-1600	Ecuador, HCJB Quito	11925am	17890am	21455am	
1500-1600	Ethiopia, Voice of	7165af			
1500-1600	Ghana, Radio 1, Accra	4915do			
1500-1600	Ghana, Radio 2, Accra	7295do			
1500-1600	Guam, KTWR Guam	11650as			
1500-1600	Japan NHK	11865am			
1500-1600	Jordan	9560eu			
1500-1600 mtwhf	Kenya, Voice of	4935do			
1500-1600	Luxembourg, RTL	15350va			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malta, V. of the Medit.	11925eu			
1500-1600	Myanmar, Voice of, Burma	5990do			
1500-1600	Nigeria	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	7370va	9655na	9755na	11665na
		11840na	11995na	12015va	12030na
		12050na	13645na	15405na	15485na
		17670na			
1500-1600 twhfa	Seychelles, FEBA	9810as	15330as		
1500-1600	Sierra Leone, SLBS	3316do	5980do		
1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600 vl	South Africa,Radio Oranje	9630do			
1500-1600	Sri Lanka B'casting Corp.	6075as	9720as		
1500-1600	USA, CSMonitor Boston	9530as	13625as	13760pa	15665eu
		17555am			
1500-1600 sa	USA, CSMonitor Boston	13710na			
1500-1600	USA, KTBN Salt Lake City	15590na			
1500-1600	USA, VOA Washington	6110as	7125as	9645as	9760as
		15395as			
1500-1600	USA, VOA Washington	9700eu	15205me		
1500-1600	USA, WHRI Noblesville	9465sa	15105na		
1500-1600	USA, WJCR Upton, Kentucky		7490na		
1500-1600 vl, irr	USA, WRNO New Orleans	15420na			
1500-1600	USA, WWCR Nashville	15690am	17535na		
1500-1600	USA, WYFR Okeechobee, FL		11705am	11830am	
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1600	Austria, ORF Vienna	6155eu	11780as	13730eu	21490va
1530-1600	Netherlands	9890as	15150as	17580as	17605as
		21665as			
1530-1600	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1530-1600	Switzerland, SRI	15430va			
1530-1600	Tanzania	5985af	9684af	11765af	
1530-1600	United Kingdom,BBC London	6190af	6195eu	6195as	7180as
		9410eu	9740na	9750eu	11750as
		11775na	12095eu	15070va	15260as
		15310as	15400af	17640va	17705eu
		17840na	17880af	21470af	21660af
1545-1600	South Korea World News	7275va			
1545-1600	Vatican Radio	15090au	17865au		

SELECTED PROGRAMS

Sundays

1500 BBC (Africa): Postmark Africa. See S 0335.
1505 Christian Science Monitor: Herald Of Christian Science. SeeS 0005.
1505 Swiss Radio Int'l: Feature. See S 0605.
1509 Deutsche Welle: Religion And Society. News and developmentsconcerning the world's major religions.
1513 Deutsche Welle: Through German Eyes. German journalists provide a perspective on world events.
1515 BBC: Concert Hall. Classical music from the world's great concert halls.
1534 Deutsche Welle: Pop From Germany. A look at the German pop music scene.

Mondays

1505 Swiss Radio Int'l: Dateline. See M 0605.
1506 Christian Science Monitor: Encore. See M 0106.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC (Africa): Focus On Africa. African politics, sports, economics, medicine, and media.
1515 BBC: Feature/Drama. See M 0101.
1534 Christian Science Monitor: Letterbox. See M 0134.
1534 Deutsche Welle: Monday Special. An interview or report on anevent or development with special relevance for Africa.
1547 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

1505 Swiss Radio Int'l: Dateline. See M 0605.
1506 Christian Science Monitor: Home Forum. See M 2306.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC (Africa): Focus On Africa. See M 1515.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1534 Christian Science Monitor: Letterbox. See M 0134.
1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.
1547 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

1505 Swiss Radio Int'l: Dateline. See M 0605.
1506 Christian Science Monitor: Curtain Call. See T 2306.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC (Africa): Focus On Africa. See M 1515.
1515 BBC: Talks. See M 0415.
1530 BBC: Comedy/Drama. The BBC's crack comedy team a presents half-hour production (except 28th: Two Cheers For October, a humorous look back at the month just past).
1534 Christian Science Monitor: Letterbox. See M 0134.
1534 Deutsche Welle: Living In Germany. See M 0116.
1547 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

1505 Swiss Radio Int'l: Dateline. See M 0605.
1506 Christian Science Monitor: Kaleidoscope. See W 2306.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC (Africa): Focus On Africa. See M 1515.
1515 BBC: Music. See S 2315.
1534 Christian Science Monitor: Letterbox. See M 0134.
1534 Deutsche Welle: Spotlight On Sport. Background stories and coverage of important sporting events.
1547 Christian Science Monitor: Religious Article. See M 0147.

Fridays

1505 Swiss Radio Int'l: Dateline. See M 0605.
1506 Christian Science Monitor: Arts Forum or Sportsworld. See H2306.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC (Africa): Focus On Africa. See M 1515.
1515 BBC: Music Review. See H 2315.
1534 Christian Science Monitor: Letterbox. See M 0134.
1534 Deutsche Welle: Economic Notebook. See T 0334.
1547 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

1500 BBC (Africa): Spice Taxi. See A 0630.
1505 Christian Science Monitor: Herald Of Christian Science. SeeS 0005.
1505 Swiss Radio Int'l: Grapevine. See S 0005.
1509 Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.
1513 Deutsche Welle: Development Forum. Reports and interviews onprojects and progress in Africa and Asia.
1515 BBC: Sportsworld. See A 1430.
1518 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
1534 Deutsche Welle: Science And Technology. See M 0234.

1600 UTC [12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1605	Singapore, SBC1	5010do	5052do	11940do	
1600-1610	Lesotho, Maseru	4800do			
1600-1610	Malawi B'casting Corp.	3381do			
1600-1625	Netherlands	9890as	15150as	17580as	17605as
		21665as			
1600-1630	Canada, RCI Montreal	11935eu	15305eu	15325eu	17820eu
		21545eu			
1600-1630 as	Norway	15230af	17720as		
1600-1630	Pakistan	11570me	13665me	15060me	15550af
		17555af	17725me		
1600-1630	United Kingdom,BBC London	5975as	6190af	6195eu	9410eu
		9515na	9630af	9740me	9750eu
		11750as	11940af	12095eu	15070eu
		15400af	17640va	17695eu	17705eu
		17840na	17860af	17880af	
		7180as	15260na	15310as	21470af
		21660af			
1600-1630	USA, VOA Washington	9700eu	15205me		
1600-1630	Vietnam, Voice of	9840eu	12020eu	15010eu	
1600-1630	Yemen	5970as	7190as		
1600-1635	Guam, KTWR Guam	11650as			
1600-1640 vl	South Africa,Radio Oranje	9630do			
1600-1640	Vatican Radio	15090au	17865au		
1600-1645	UAE Radio, Dubai	11795af	13675eu	15320eu	21605eu
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15105as
		15415as	15595as	17810as	21680as
1600-1700	Australia	5995pa	6060pa	6080pa	9580pa
		9860pa	11910pa	12000pa	13755pa
		15170as	17565pa		
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, Radio Beijing	4130do	8260af	11575af	15130af
		15170af			
1600-1700	Cook Islands	11760pa			
1600-1700	Costa Rica, RFPI	15030na			
1600-1700	France, RFI Paris	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1700	Ghana, Radio 1, Accra	4915do			
1600-1700	Ghana, Radio 2, Accra	7295do			
1600-1700	Guam, KSDA Guam	11980as			
1600-1700 mtwhf	Kenya, Voice of	4935do			
1600-1700	Korea, Seoul	5975om	9870af		
1600-1700	Luxembourg, RTL	15350va			
1600-1700	Nigeria	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1700	Russia, Radio Moscow	9755na	9825na	11665na	11840na
		11900va	11940va	11995na	12030na
		12050na	13645na	13665va	15375na
		15425na	15485na	17670na	17695na
1600-1700	Saudi Arabia BC Svc	9705eu	9720eu		
1600-1700	Sierra Leone, SLBS	3316do	5980do		
1600-1700	South Africa, Radio RSA	9565af	11885af		
1600-1700	Sri Lanka B'casting Corp.	6075as	9720as		
1600-1700	Swaziland, TWR Swaziland	9600af			
1600-1700	Tanzania	5985af	9684af	11765af	
1600-1700	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1600-1700 sa	USA, CSMonitor Boston	13710na	17555am		
1600-1700	USA, KTBN Salt Lake City	15590am			
1600-1700	USA, VOA Washington	9575af	11920af	11995af	15225af
		15410af	15495af	15580af	17650af
		17800af	21625af		
1600-1700	USA, WHRI Noblesville	9465am	15105am		
1600-1700	USA, WJCR Upton, Kentucky		7490na		
1600-1700 vl, irr	USA, WRNO New Orleans	15420na			
1600-1700	USA, WWCR Nashville	15690am	17535am		
1600-1700	USA, WYFR Okeechobee, FL	11705na	11830am	15355am	17750na
		21525eu	21615af		
1610-1615 mtwhf	Botswana, Gaborone	5955af	7255af		
1620-1658 mtwhf	Morocco, Rabat	17595as			
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Ecuador, HCJB Quito	15270me	17790me	21455me	
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700 mtwhf	Portugal	21515me			
1630-1700	United Kingdom,BBC London	5975as	6190af	6196eu	9410eu
		9515na	9630af	9740me	11750as
		11940af	12095eu	15070eu	15260na
		15310as	15400af	15420af	17640va
		17695eu	17860af	17880af	
		21470af	21660af		
1630-1700	USA, VOA Washington	6180eu	9700eu	9760me	11710me
		15205me	15245me		
1635-1700 s	Guam, KTWR Guam	11650as			
1650-1700 smtwhf	New Zealand, RNZI	9670pa			

SELECTED PROGRAMS

Sundays

1600 Radio Norway Int'l: Norway Today. See S 0000.
1605 Christian Science Monitor: The Sunday Service. A religious service from the First Church of Christ, Scientist, in Boston.
1609 Deutsche Welle: Arts On The Air. See S 1109.
1615 BBC: Feature. See S 0230.
1634 Deutsche Welle: German By Radio. See S 0134.
1645 BBC: Letter From America. See S 0615.

Mondays

1606 Christian Science Monitor: News Features And Interviews. SeeM 0006.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: New Ideas. Innovative developments in technology and new products.
1634 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and background news from the Asia-Pacific region.
1635 BBC: Talks. This month, head for jungle to hear "The Naturalist's Tale."
1645 BBC: The World Today. A look at a topical aspect of the international scene.

Tuesdays

1606 Christian Science Monitor: News Features And Interviews. SeeM 0006.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Megamix. See T 1130.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1645 BBC: The World Today. See M 1645.

Wednesdays

1606 Christian Science Monitor: News Features And Interviews. SeeM 0006.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Rock/Pop Music. See T 0630.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1645 BBC: The World Today. See M 1645.

Thursdays

1606 Christian Science Monitor: News Features And Interviews. SeeM 0006.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Network UK. Issues and events affecting people across the UK.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1645 BBC: The World Today. See M 1645.

Fridays

1606 Christian Science Monitor: News Features And Interviews. SeeM 0006.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Science In Action. The latest news about scientific innovations.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1645 BBC: The World Today. See M 1645.

Saturdays

1600 Radio Norway Int'l: Norway Today. See S 0000.
1605 Christian Science Monitor: Herald Of Christian Science. SeeS 0005.
1609 Deutsche Welle: International Talking Point. See S 0419.
1615 BBC: Sportsworld. See A 1430.
1623 Deutsche Welle: Development Forum. See A 1513.

English language

shortwave guide

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1705	Ghana, Radio 2, Accra	7295do			
1700-1710	Cameroon CRTV Bafoussam		4000do		
1700-1715	Israel, Kol Israel	11587na	11675eu	15590af	15650va
1700-1728	Sierra Leone, SLBS	3316do	5980do		
1700-1730 mtwhf	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1730 as	Norway	9655eu			
1700-1730	Sri Lanka B'casting Corp.	6075as	9720as		
1700-1730	Swaziland, TWR Swaziland	3200af	9520af		
1700-1730	Swiss Radio Int'l	13635af	15430af	17635af	21770af
1700-1730	United Kingdom,BBC London	9515na	15260na	17895af	21470af
		21660af			
		3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740eu	11750as	11775na	12095eu
		15070eu	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
1700-1730	USA, VOA Washington	3980eu	6040me	9575af	9700eu
		9760me	11920af	15205me	15410af
		15445af	15495af	15580af	17650af
		17800af	21625af		
1700-1750	North Korea	9325eu	9640af	9977af	11705eu
1700-1755	Polish Radio Warsaw	7270eu	9525eu		
1700-1800	Algeria, R. Algiers	17745na			
1700-1800	Australia	5995pa	6060pa	6080pa	9540pa
		9580pa	9860pa	11910pa	12000pa
		13755pa	15170as		
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, Radio Beijing	4130af	8260af	9570af	11575af
		15345af			
1700-1800	Cook Islands	11760pa			
1700-1800	Costa Rica, RFPI	13630na	15030na		
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 sa	Eq.Guinea, R.East Africa	7190af			
1700-1800	Ghana, Radio 1, Accra	4915do			
1700-1800	Guam, KSDA Guam	13720af			
1700-1800 varies	Italy, IRRS Milan, Italy	7125eu			
1700-1800	Japan NHK	7140as	11815na	11865na	15210me
		15345me			
1700-1800 mtwhf	Kenya, Voice of	4935do			
1700-1800	Luxembourg, RTL	15350va			
1700-1800 smtwhf	New Zealand, RNZI	9675pa			
1700-1800	Nigeria	3326do	4990do		
1700-1800	Nigeria, Voice of	7255af			
1700-1800	Pakistan	11570eu	15550eu		
1700-1800	Russia, Radio Moscow	11840na	11900va	11940va	11995na
		12030na	12050na	13645na	13665va
		15375na	15425na	15580na	17670na
		17695na	17710na		
1700-1800	Saudi Arabia BC Svc	9705eu	9720eu		
1700-1800	South Africa, Radio RSA	9565af	11885af		
1700-1800	Tanzania	5985af	9684af	11765af	
1700-1800	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston	13710na	17555am		
1700-1800	USA, KTBN Salt Lake City	15590am			
1700-1800	USA, VOA Washinton	6110as	7125as	9645as	15395as
1700-1800	USA, WHRI Noblesville	13760am	15105am		
1700-1800	USA, WJCR Upton, Kentucky		7490na		
1700-1800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
1700-1800 vl, irr	USA, WRNO New Orleans	15420na			
1700-1800	USA, WWCR Nashville	15690na	17535na		
1700-1800	USA, WYFR Okeechobee, FL		21500va		
1706-1800	Ghana, Radio 2, Accra	3366do			
1715-1730	Cameroon CRTV Beau	3970do			
1715-1730	South Korea World News	7550as	15575as		
1715-1730	Vatican Radio	6245eu	7250eu		
1715-1745	United Kingdom,BBC London	9560ca	21660ca		
1728-1800	Sierra Leone, SLBS	3316do			
1730-1745 a	Cameroon CRTV Douala	4795do			
1730-1800	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
		17780af	17825af		
1730-1800 a	Latvia, Radio Riga	5935eu			
1730-1800	Netherlands	6020af	9605af	21515af	21590af
1730-1800	Romania, R.Romania Int'l	15340af	15365af	17745af	17805af
1730-1800	Swaziland, TWR Swaziland	3200af			
1730-1800	United Kingdom,BBC London	3255af	3915as	5975as	6005af
		6180eu	6190af	6195eu	9410eu
		9630af	9740me	11775na	12095eu
		15070eu	15260na	15310as	15400af
		15420af	17640va	17695eu	17860af
		17880af	21660af		
1730-1800	USA, VOA Washington	6040eu	9575af	9700eu	9760eu
		11920af	15205eu	15205me	15410af
		15495af	15580af	17650af	17800af
		21625af			
1730-1800	Vatican Radio	11625af	15090af	17730af	
1740-1800	Cameroon CRTV Yaounde	4850do			
1745-1800 mtwhfa	Cameroon CRTV Douala	4795do			
1745-1800	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1745-1800 tent	Madagascar,RTV Madagascar		3232do	3286do	5005do

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1810	Malawi B'casting Corp.	3381do			
1800-1825	Belgium, BRT Brussels	9905eu	17750af		
1800-1825	Netherlands	6020af	9605af	21515af	21590af
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1830	Congo, RTV Congolaise	3265af	4765af		
1800-1830	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
1800-1830	Egypt, Radio Cairo	15255af			
1800-1830	United Kingdom,BBC London	3255af	3955eu	5975as	6180eu
		6190af	6195eu	7160me	7325af
		9410eu	9600af	9740me	11750as
		12095eu	15070eu	15310as	15400af
		17640eu	17880af	21660af	
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1800-1840 w	Cameroon CRTV Bertoua	4750do			
1800-1845 mtwhfa	Cameroon CRTV Douala	4795do			
1800-1845	Swaziland, TWR Swaziland	3200af	9600af		
1800-1850 smtwhf	New Zealand, RNZI	9675pa			
1800-1900	Australia	5995pa	6060pa	6080pa	9505pa
		9580pa	9860pa	11910pa	12000pa
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
	17780af 17825af				
1800-1900	Cameroon CRTV Yaounde	4850do			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Cook Islands	11760pa			
1800-1900	Costa Rica, RFPI	13630am	15030am	21465na	
1800-1900 sa	Eq.Guinea, R.East Africa	7190af			
1800-1900	Ethiopia, Voice of	9662af			
1800-1900	Ghana, Radio 1, Accra	4915do			
1800-1900	Ghana, Radio 2, Accra	7295do			
1800-1900	Guam, KSDA Guam	13720as			
1800-1900	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1800-1900 varies	Italy, IRRS Milan, Italy	7125eu			
1800-1900	Ivory Coast, Abidjan	11920af			
1800-1900 mtwhf	Kenya, Voice of	4935do			
1800-1900	Korea, Seoul	15575eu			
1800-1900	Kuwait, Radio Kuwait	13620na			
1800-1900	Luxembourg, RTL	15350va			
1800-1900 irreg	Mozambique	3265af	4855af	9618af	
1800-1900	Nigeria	3326do	4990do		
1800-1900	Russia, Radio Moscow	9795va	9855va	9860va	9875va
		9895va	11630va	11685va	11745va
		11840am	11995na	12030na	12050na
		15375va	15425na	15515na	15580va
		17565va	17655va	17695na	17710na
1800-1900	Saudi Arabia BC Svc	9705eu	9720eu		
1800-1900	Sierra Leone, SLBS	3316do			
1800-1900	Tanzania	5985af	9684af	11765af	
1800-1900	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1800-1900 sa	USA, CSMonitor Boston	17555am			
1800-1900	USA, KTBN Salt Lake City	15590			
1800-1900	USA, VOA Washington	6040eu	9700eu	9760me	15205me
		6040eu	9575af	9700eu	9760me
		11920af	15205me	15410af	15445af
		15580af	17650af	17800af	21625af

1800 UTC cont'd

1800-1900	USA, WHRI Noblesville	13760na	17835sa		
1800-1900	USA, WINB Red Lion, Penn.	15295eu			
1800-1900	USA, WJCR Upton, Kentucky		7490na		
1800-1900	USA, WMLK Bethel, Penna.	9465eu			
1800-1900	USA, WWCR Nashville	15690na	17535na		
1800-1900	USA, WYFR Okeechobee, FL		21500va		
1815-1830	Lebanon, Radio Voice of	6550me			
1815-1900	Bangladesh	12030as	15255as		
1830-1900	Afghanistan, Kabul	9635am			
1830-1900	Austria, ORF Vienna	5945eu	6155eu	12010me	13730af
1830-1900 as	Canada, RCI Montreal	13670me	15260me	17820me	
1830-1900	Finland, YLE	6120eu	9730af	11755af	15440eu
1830-1900	Iran, Islamic Republic	9022af	15260eu		
1830-1900	Netherlands	6020af	9605af	21515af	21590af
1830-1900	Sri Lanka B'casting Corp.	9720eu	15120eu		
1830-1900	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7325eu	9410eu
		9600af	11750as	11955va	12095eu
		15070eu	15400af	17880af	21660af
1830-1900 WAR/var	Yugoslavia	6100eu	15140af		
1833-1900	Ivory Coast, Abidjan	11920af			
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1845-1900	Ghana B'casting Corp.	6130af			
1845-1900	Guinea, RTV Conarky	4900af	7125af		
1845-1900 s	Mali, RTV Mali	4783do	4835do	5995do	7285do
1845-1900	Swaziland, TWR Swaziland	3200af			
1850-1900 smtwhf	New Zealand, RNZI	15120pa			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1915	Tanzania	5985af	9684af	11765af	
1900-1920	Brazil, Radiobras	15265eu			
1900-1925	Netherlands	6020af	9605af	21515af	21590af
1900-1930 mtwhf	Canada, RCI Montreal	13670me	15260me	17820me	
1900-1930 as	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-1930	Iran, Islamic Republic	9022af	15260eu		
1900-1930	Israel, Kol Israel	11587eu	11605sa	11675eu	15640eu
		17575eu	17630af		
1900-1930	Ivory Coast, Abidjan	11920af			
1900-1930	Japan NHK	9640am	11850af	11865va	
1900-1930 s	Lebanon, King of Hope	11530me			
1900-1930 as	Norway	17860va	21705va		
1900-1930	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1900-1945	Cameroon CRTV Yaounde	4850do			
1900-1950	Germany, Deutsche Welle	11785af	11810af	13780af	13790af
		15350af	15390af	17810af	
1900-2000	Argentina,RAE BuenosAires	15345eu			
1900-2000	Australia	5995pa	6060pa	6080pa	7240pa
		9505pa	9580pa	9860pa	11720as
		11910pa	12000pa		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000 mtwhf	Canada, RCI for UN Forces	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-2000	China, Radio Beijing	9440af	11515af		
1900-2000	Cook Islands	11760pa			
1900-2000	Costa Rica, RFPI	13630am	15030am	21465na	
1900-2000	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	
1900-2000 sa	Eq.Guinea, R.East Africa	7190af			
1900-2000	Ghana B'casting Corp.	6130af			
1900-2000	Ghana, Radio 1, Accra	4915do			
1900-2000	Ghana, Radio 2, Accra	7295do			
1900-2000	India, All India Radio	7412va	9950va	11620va	11860va
		11935va	15080va		
1900-2000 mtwhf	Kenya, Voice of	4935do			
1900-2000	Kuwait, Radio Kuwait	13620na			
1900-2000	Luxembourg, RTL	15350va			
1900-2000 s	Morocco, Rabat	11920as			
1900-2000 smtwhf	New Zealand, RNZI	15120pa			
1900-2000	Nigeria	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000	Romania, R.Romania Int'l	7145eu	9690eu	9750eu	11940eu
1900-2000	Russia, Radio Moscow	11840am	11900va	12050va	12055va
		12060va	12070na	13645na	13665va
		15180na	15375na	15405na	15415na
		15425na	15500na	15580na	17565va
		17605na	17655va	17695na	17795va
1900-2000	Saudi Arabia BC Svc	9705eu	9720eu		
1900-2000	Sierra Leone, SLBS	3316do			
1900-2000	Spanish National Radio	6130as	9675af	9685eu	9875eu
1900-2000	Sri Lanka B'casting Corp.	9720eu	15120eu		
1900-2000	Swaziland, TWR Swaziland	3200af	3240af		
1900-2000	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1900-2000 sa	USA, CSMonitor Boston	17555am			
1900-2000	USA, KTBN Salt Lake City	15590am			
1900-2000	USA, KVOH Los Angeles	17775sa			
1900-2000	USA, VOA Washington	6040eu	9525as	9575af	9700eu
		9760eu	11710eu	11870as	11920af
		15180au	15205eu	15410af	15445af
		15495af	15580af	17800af	
1900-2000	USA, WHRI Noblesville	13760na	17835na		
1900-2000	USA, WINB Red Lion, Penn.	15295eu			
1900-2000	USA, WJCR Upton, Kentucky		7490na		
1900-2000	USA, WMLK Bethel, Penna.	9465eu			
1900-2000	USA, WWCR Nashville	15690am	17535na		
1900-2000	USA, WYFR Okeechobee	15355eu	21615af		
1910-1915	Botswana, Gaborone	3356af			
1920-1930	Cameroon CRTV Beau	3970do			
1930-2000	Canada, RCI Montreal	6010eu	7230eu	13650eu	15325eu
		17875eu	21675eu		
1930-2000	Czechoslovakia	6055eu	7345eu		
1930-2000 fa	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
1930-2000	Netherlands	17605af	21590af		
1930-2000	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
1930-2000	Saipan, KFBS Saipan	9460af			
1930-2000	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1935-1945	Togo, RTV Togolaise	5047af			
1935-1955	Italy, RAI, Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
1945-2000	Bulgaria, Radio Sofia	11765as	17780as	17825as	
1945-2000	South Korea World News	6135as			
1950-2000	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1950-2000	Vatican Radio	5885eu	7250eu		

This QSL from Radio Nederland was submitted by John Carson of Norman, OK.

English language

shortwave guide

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2010 w	Malawi B'casting Corp.	3381do			
2000-2010 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
2000-2015 mtwhfa	Greece, Voice of	7450eu	9395eu		
2000-2025	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
2000-2030	Bulgaria, Radio Sofia	11765as	17780as	17825as	
2000-2030	Netherlands	17605af	21590af		
2000-2030	Nigeria, Voice of	7255af			
2000-2030 mtwhf	Portugal	11740eu			
2000-2030	Swiss Radio Int'l	9885eu	9885me	12035me	13635me
		15505me			
2000-2030	United Kingdom,BBC London	3255af	3955eu	5975eu	6005af
		6180eu	6190af	6195eu	7160me
		7180pa	7325eu	9410eu	9600as
		9630af	11750pa	12095eu	15070eu
		15260sa	15340pa	15400af	17880af
		21660af			
2000-2030	Vatican Radio	9645af	11625af	15090af	
2000-2050	North Korea	6576eu	9345eu	9640af	9977af
2000-2100	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	9860pa	11720as	11910pa
		12000pa			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, Radio Beijing	4130eu	9440af	9920eu	11500eu
		11715af	15170af		
2000-2100	Cook Islands	11760pa			
2000-2100	Costa Rica, RFPI	13630na	15030na	21465am	
2000-2100	Cuba, RHC Havana	15330eu	17705eu	17815me	
2000-2100 sa	Eq.Guinea, R.East Africa	7190af			
2000-2100	Ghana, Radio 1, Accra	4915do			
2000-2100	Ghana, Radio 2, Accra	7295do			
2000-2100	India, All India Radio	11935af	15080af		
2000-2100	Indonesia, Voice of	7125as	9675as	11752as	11785as
2000-2100	Kuwait, Radio Kuwait	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Luxembourg, RTL	15350va			
2000-2100 smtwhf	New Zealand, RNZI	15120pa			
2000-2100	Nigeria	3326do	4990do		
2000-2100	Russia, Radio Moscow	11675na	11840na	12050va	13665na
		15375na	15405na	15425na	15500va
		15560na	17655va	17695na	17795va
2000-2100	Saudi Arabia BC Svc	9705eu	9720eu		
2000-2100	Sierra Leone, SLBS	3316do			
2000-2100	Swaziland, TWR Swaziland	3200af	3240af		
2000-2100	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510am
		17555sa			
2000-2100	USA, KTBN Salt Lake City	15590am			
2000-2100	USA, KVOH Los Angeles	17775sa			
2000-2100	USA, VOA Washington	6040eu	9700eu	9760eu	11710eu
		13710af	15160eu	15205eu	15410af
		15445af	15494af	15580af	17650af
		17800af	17895af	21485af	21625af
2000-2100	USA, WHRI Noblesville	13760af	17835va		
2000-2100	USA, WJCR Upton, Kentucky		7490na		
2000-2100	USA, WMLK Bethel, Penna.	9465eu			
2000-2100	USA, WRNO New Orleans	15420na			
2000-2100	USA, WWCR Nashville	15690na	17535na		
2000-2100	USA, WYFR Okeechobee, FL	7355eu	15566eu	15585eu	17750af
		21525eu			
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2015-2030	Benin, Voice of the Rev.	4870af	5025af		
2025-2045	Italy, RAI, Rome	7235me	9575me	11800me	
2030-2035	Latvia, 1st Programme	5935do			
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mh	Estonia, Tallinn	5925eu	9560eu		
2030-2100 varies	Georgian Radio, Tbilisi	11760eu			
2030-2100	Korea, Seoul	6480eu	7550af	15575eu	
2030-2100	Sweden	6065va	9655va	17730as	
2030-2100	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6040	6180eu	6190af	6195eu
		7180pa	7325eu	9410e[illegible]	11750pa
		12095eu	15070eu	15260[illegible]	15340pa
		15400af	15495	15580as	
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	South Korea World News	5975as			

2100 UTC [5:00 PM EDT/2:00 PM PDT]

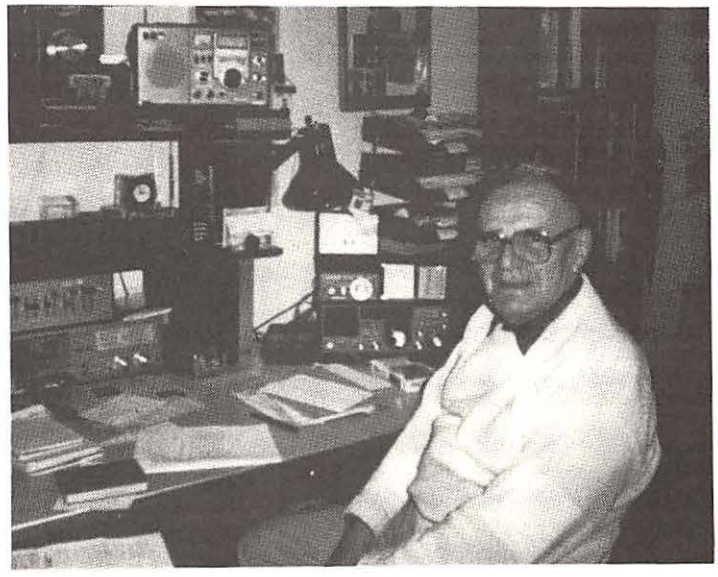
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2110	Malawi B'casting Corp.	3381do			
2100-2110	Vatican Radio	5885eu	7250eu		
2100-2115	Swaziland, TWR Swaziland	3240af			
2100-2125	Belgium, BRT Brussels	5910eu	9905eu		
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	
2100-2130	China, Radio Beijing	3985eu	11715af	15170af	
2100-2130	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2100-2130	Korea, Seoul	6480eu	7550af	15575eu	
2100-2130	Lebanon, King of Hope	6280me			
2100-2130 smtwhf	New Zealand, RNZI	15120pa			
2100-2130 as	Norway	17845na	21705va		
2100-2130 mtwhf	Portugal	15250af			
2100-2130	Sweden	6065va	9655va	17730as	
2100-2130	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2100-2145 WAR/var	Yugoslavia	6100eu	11735na	11870na	
2100-2150	Germany, Deutsche Welle	9670eu	9765eu	11785eu	13780as
		15350as	15360as		
2100-2200	Australia	5995pa	6060pa	6080pa	11720pa
		11880pa	13705pa	15365as	
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, RCI Montreal	15325af	17875af		
2100-2200	China, Radio Beijing	4130eu	8260eu	9920eu	11500eu
		15170eu			
2100-2200	Cook Islands	11760pa			
2100-2200	Costa Rica, RFPI	13630na	15030na	21465am	
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200 sa	Eq.Guinea, R.East Africa	7190af			
2100-2200	Ghana, Radio 1, Accra	4915do			
2100-2200	Ghana, Radio 2, Accra	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2100-2200	Japan NHK	11815me	11840eu	15430eu	17810as
		17890as			
2100-2200	Luxembourg, RTL	15350va			
2100-2200	Nigeria	3326do	4990do		
2100-2200	Romania, R.Romania Int'l	5955eu	7145eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, Radio Moscow	9685na	11780na	11840na	12040na
		12050na	12070na	13645na	13665na
		15355na	15375na	15405na	15425na
		15485na	15500na	15560na	17655va
		17710va	17735va	21690va	
2100-2200	Sierra Leone, SLBS	3316do			
2100-2200	Spanish National Radio	6130eu			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2200	Ukraine, Kiev	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2200	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510na
		17555sa			
2100-2200	USA, KTBN Salt Lake City	15590na			
2100-2200	USA, KVOH Los Angeles	17775sa			
2100-2200	USA, VOA Washington	6040eu	9700eu	9760me	11710me
		11870pa	11960me	15185pa	15205me
		15410af	15495af	15580af	17650af
		17735pa	17800af	17895me	19261af
		21485af	21625af		
2100-2200	USA, WHRI Noblesville	13760am	17835na		
2100-2200	USA, WJCR Upton, Kentucky		7490na		
2100-2200	USA, WMLK Bethel, Penna.	9465eu			
2100-2200	USA, WRNO New Orleans	15420na			
2100-2200	USA, WWCR Nashville	15690am	17535am		
2100-2200	USA, WYFR Okeechobee, FL	7355eu	15566eu	17750af	21525eu
2103-2110 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2130 s	Indonesia, R. Republik	6070do			
2115-2130 mtwhf	United Kingdom,BBC Carib.	15140ca	17715ca		
2115-2200	Egypt, Radio Cairo	9900eu			
2130-2145	Cameroon CRTV Beau	3970do			
2130-2155	Finland, YLE	6120af	11755as	15440eu	
2130-2200	Austria, ORF Vienna	5945eu	6155eu	9870af	
2130-2200	Canada, RCI Montreal	11880af	15150af	17820af	

2100 UTC cont'd

2130-2200	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	21480eu
2130-2200	Israel, Kol Israel	11585eu	11605eu	15100na	15590eu
		15640sa	17575eu		
2130-2200	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200	New Zealand, RNZI	17770pa			
2130-2200	United Kingdom,BBC Falk.I	13660sa			
2130-2200	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2145-2200	Bulgaria, Radio Sofia	11660na	11720am	15330eu	
2145-2200	Cameroon CRTV Yaounde	4850do			

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2210	Cameroon CRTV Bafoussam		4000do		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2215	Cameroon CRTV Yaounde	4850na			
2200-2218	Congo, RTV Congolaise	4765do	5985do		
2200-2225	Italy, RAI, Rome	9710as	11800as	15330as	
2200-2230	Albania, Radio Tirana	9760eu	11825eu		
2200-2230	Canada, RCI Montreal	5960na	9755na	11705as	11905na
		13670na			
2200-2230 2Russia	China, Radio Beijing	9740eu			
2200-2230	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2200-2230 a	Indonesia,Radio Republik	3385do	4805do		
2200-2230	Swiss Radio Int'l	9810sa	9885sa	12035sa	15570sa
2200-2230 s	USA, KGEI San Francisco	15280sa			
2200-2230	USA, VOA Washinton	9530eu	11905me	11960me	15225me
		15445me	17885eu		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	USA, WINB Red Lion, Penn.	15185eu	15195eu		
2200-2300	Australia	11720pa	11880pa	13705as	15240pa
		15320pa	15365as	17795pa	
2200-2300	Bulgaria, Radio Sofia	11660am	11720am	15330eu	
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Cook Islands	11760pa			
2200-2300	Costa Rica, RFPI	13630ca	15030ca	21465am	
2200-2300	Cuba, RHC Havana	9620va	11930va		
2200-2300 sa	Eq.Guinea, R.East Africa	7190af			
2200-2300	Ghana, Radio 1, Accra	4915do			
2200-2300	Ghana, Radio 2, Accra	7295do			
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2300	Luxembourg, RTL	15350va			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, RNZI	17770pa			
2200-2300	Nigeria	3326do	4990do		
2200-2300	Russia, Radio Moscow	11710na	12050na	15355na	15405na
		15410na	15425na	15485na	17655va
		17720va	17735na	21690na	
2200-2300	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2300	Taiwan, V. of Free China,	17750eu	21720eu		
2200-2300	Turkey, Voice of	9445na			
2200-2300	UAE Radio Abu Dhabi	13605na	15305na	17855na	
2200-2300	United Kingdom,BBC London	5975na	6195as	7325am	9410eu
		9570pa	9590na	9915ca	11750sa
		11945as	11955as	12095na	15070na
		15260sa	15340as	15400af	17830as
2200-2300	USA, CSMonitor Boston	9465na	13625as	15405as	15665eu
		17555am			
2200-2300	USA, KTBN Salt Lake City	15590am			
2200-2300	USA, VOA Washington	7120as	9770as	11760as	15185au
		15290au	15305au	17735au	17820au
2200-2300	USA, WHRI Noblesville	13760na	17835sa		
2200-2300	USA, WJCR Upton, Kentucky		7490na		
2200-2300	USA, WRNO New Orleans	15420na			
2200-2300	USA, WWCR Nashville	12160na	15690na		
2200-2300	USA, WYFR Okeechobee, FL		17750eu	21525eu	
2230-2300 mtwhf	Congo, RTV Congolaise	4765do			
2230-2300	Sweden	6065eu			
2230-2300	USA, VOA Washington	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Yerevan	11920am	12050am	17660am	
2245-2300	USA, WINB Red Lion, Penn.	15145eu			
2245-2300	Vatican Radio	9600au	11830au	15090au	



W. Young of Newark, DE, sent us this photo of his shack. His equipment includes a Yaesu FRG-7700, Panasonic RF-2200 and RF-2900, Gilfer M-1 Multi-Tuner, Sanyo Tape Recorder and a plain copper wire antenna inside the room.

English language

shortwave guide

2300 UTC [7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2305	Ghana, Radio 1, Accra	4915do			
2300-2305	Ghana, Radio 2, Accra	7295do			
2300-2315	Bulgaria, Radio Sofia	11660am	11720am	15330eu	
2300-2330	Canada, RCI Montreal	11940sa	15235na		
2300-2330	Lithuania, Radio Vilnius	9675na	9710na	11780na	13645na
		15580na			
2300-2330 as	Norway	11795am			
2300-2330	United Kingdom,BBC London	5975na	6175na	6195as	7145as
		9410eu	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	15340pa	15400af
		17830af			
2300-2350	North Korea	11700am	13650am		
2300-2350	Turkey, Voice of	9445na			
2300-0000	Australia	11720pa	11880pa	15240pa	15320pa
		15365as	17795pa		
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Cook Islands	11760pa			
2300-0000	Costa Rica, AWR	9725ca	11870ca		
2300-0000	Costa Rica, RFPI	13630na	15030na	21465am	
2300-0000	Guam, KSDA Guam	15610as			
2300-0000	India, All India Radio	9910as	11715as	11745as	15110as
		15145as	17830as		
2300-0000	Japan NHK	11735eu	11815am	15195as	17810pa
		17840va			
2300-0000	Luxembourg, RTL	15350va			
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do			
2300-0000	New Zealand, RNZI	17770pa			
2300-0000	Russia, Radio Moscow	11710na	12050na	15355na	15405na
		15410na	15425na	15485na	17570na
		17685na	17720va	17735na	17890na
		21690na			
2300-0000	Sierra Leone, SLBS	3316do			
2300-0000	Singapore, SBC1	5010do	5052do	11940do	
2300-0000	South Africa, Radio Orion	4810af			
2300-0000	Thailand	4830as	9655as	11905as	
2300-0000	UAE Radio Abu Dhabi	9605na	11965na	13605na	
2300-0000	USA, CSMonitor Boston	9465na	13625as	15405af	15665eu
		17555af			
2300-0000	USA, KTBN Salt Lake City	15590na			
2300-0000	USA, VOA Washington	7120as	9770as	11760au	15185au
		15290au	15305as	17735as	17820as
		9530me	11905me	11960eu	17885me
2300-0000	USA, WHRI Noblesville	9495na	13760sa		
2300-0000	USA, WINB Red Lion, Penn.	15145eu			
2300-0000	USA, WJCR Upton, Kentucky		7490na		
2300-0000	USA, WRNO New Orleans	7355na			
2300-0000	USA, WWCR Nashville	12160na	15690na		
2300-0000	USA, KVOH Los Angeles	9725am			
2315-0000 vl	Iraq, Radio Iraq Int'l	15150na	17740sa		
2330-0000 as	Canada, RCI Montreal	11940sa	15235sa		
2330-0000	Canada, RCI Montreal	9755am	11730am	13670am	
2330-0000 a	Colombia, R.Nacional	11822.5	17865am		
2330-0000	Iran, Islamic Republic	9022am	15260am	15315am	
2330-0000 m	Sri Lanka B'Casting Svc	15425am			
2330-0000	United Kingdom,BBC London	5975na	6175na	6195as	7145as
		7325na	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	17830as	
2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
2330-2355	Belgium, BRT Brussels	9930na	13655na		
2335-2345 smtwhf	Greece, Voice of	7450eu	9425sa	11645sa	

SELECTED PROGRAMS

Sundays

2300 Radio Norway Int'l: Norway Today. See S 0000.
2305 BBC: World Business Review. The previous week's news and upcoming events.
2315 BBC: Classics With Kay. No, not Tracey Ullman, but Brian Kay with his choice of classical music.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2306 Christian Science Monitor: Home Forum. News and information for the family.
2315 BBC: Talks. Paddy Fenny meets children's writer Quentin Blake in "Artists At Work" (5th); John Turtle returns with another series of "The Learning World" (through December 28th).
2330 BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
2334 Christian Science Monitor: Letterbox. See M 0134.
2347 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Curtain Call. Music and profiles of musicians.
2315 BBC: Concert Hall. See S 1515.
2334 Christian Science Monitor: Letterbox. See M 0134.
2347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Kaleidoscope. In-depth news features.
2315 BBC: From Our Own Correspondent. See S 0330.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and contests.
2334 Christian Science Monitor: Letterbox. See M 0134.
2347 Christian Science Monitor: Religious Article. See M 0147.

Hugh Croskill presents Caribbean Report for the BBC.

Thursdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Arts Forum or Sportsworld. News from the world of arts or sports.
2315 BBC: Music Review. News and views from the world of classical music.
2334 Christian Science Monitor: Letterbox. See M 0134.
2347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Encore. See M 0106.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2330 BBC: Multitrack 3. News and releases from the British alternative music scene.
2334 Christian Science Monitor: Letterbox. See M 0134.
2347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

2300 Radio Norway Int'l: Norway Today. See S 0000.
2305 BBC: Words Of Faith. See M 1209.
2305 Christian Science Monitor: Herald Of Christian Science. See S 0005.
2310 BBC: Book Choice. See W 0425.
2315 BBC: A Jolly Good Show. See T 1515.

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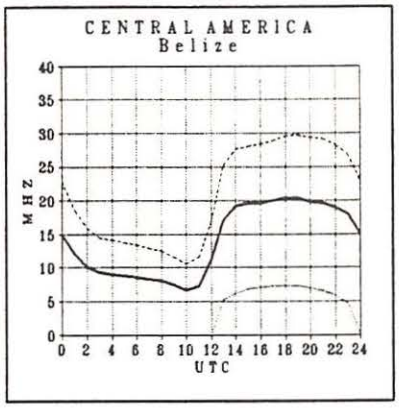
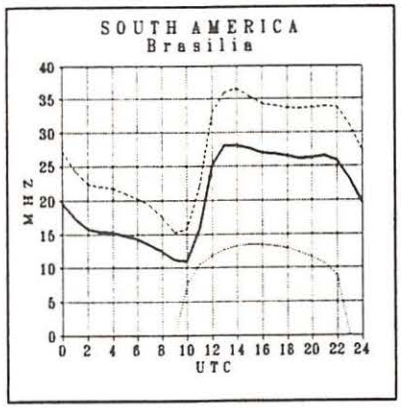
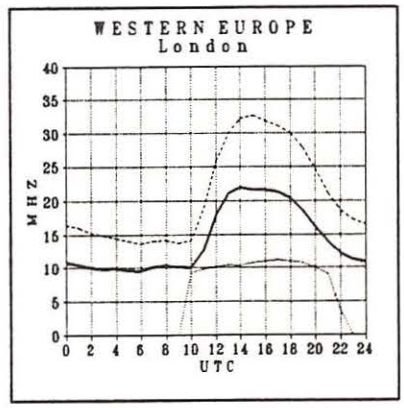
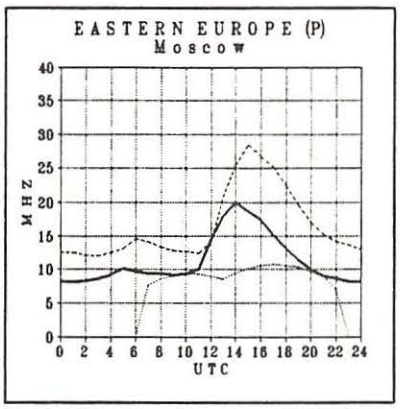
Propagation conditions: Eastern United States

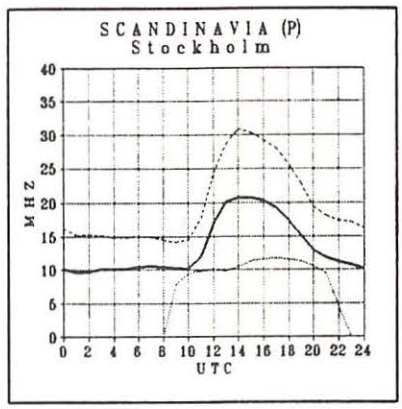
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

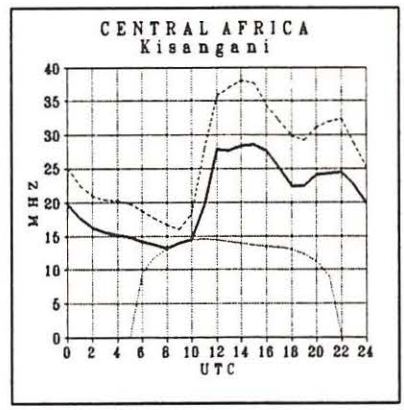


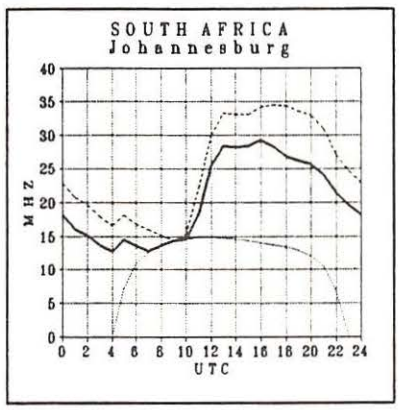


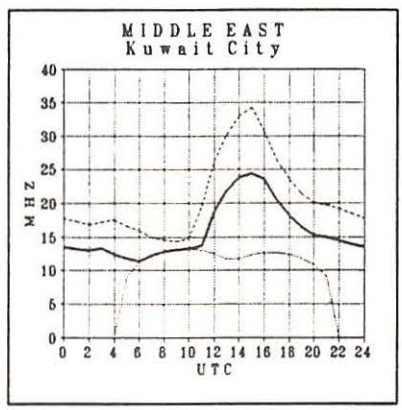


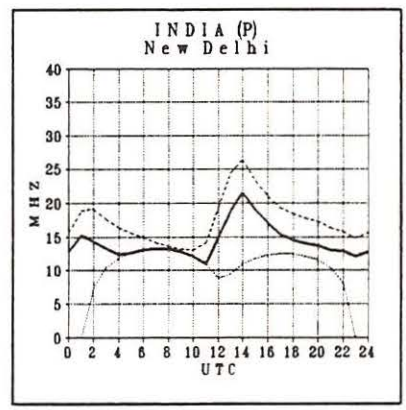


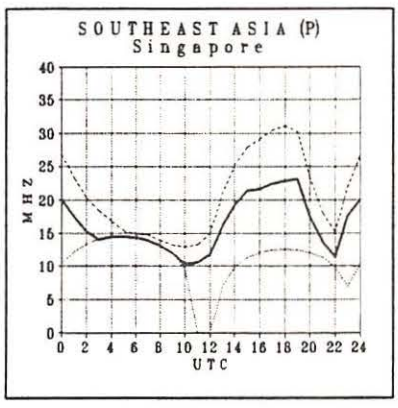


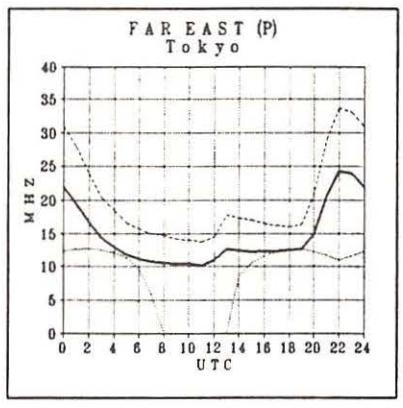


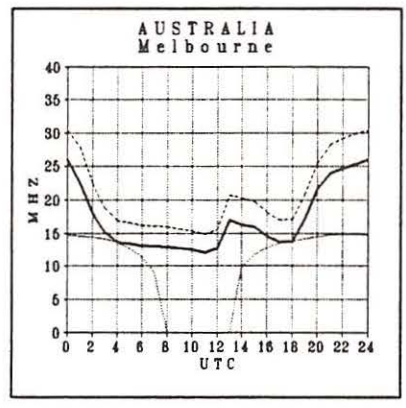






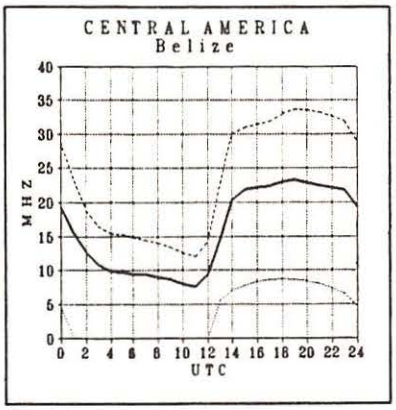


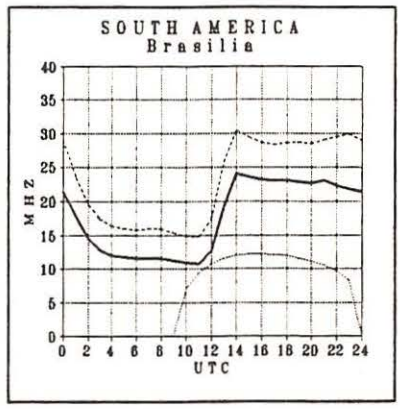


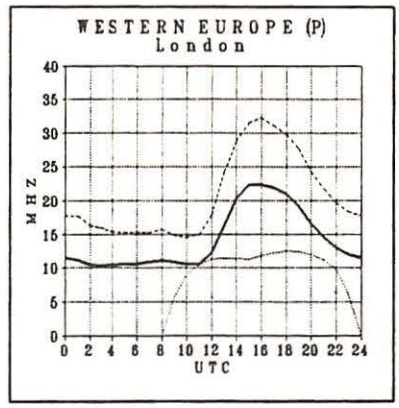


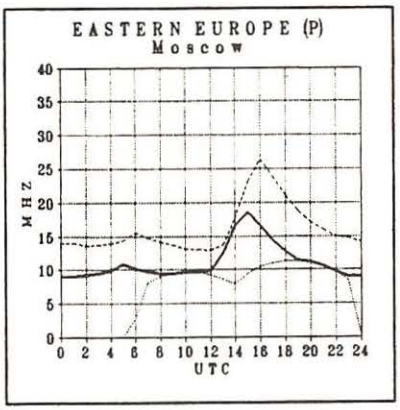
Propagation Conditions: Western United States

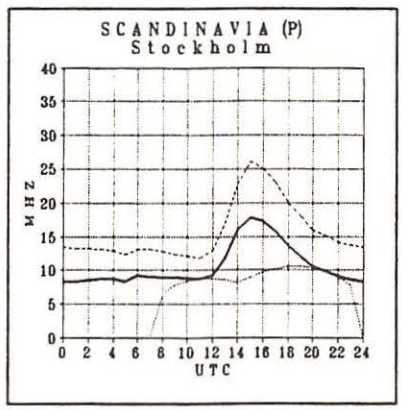
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

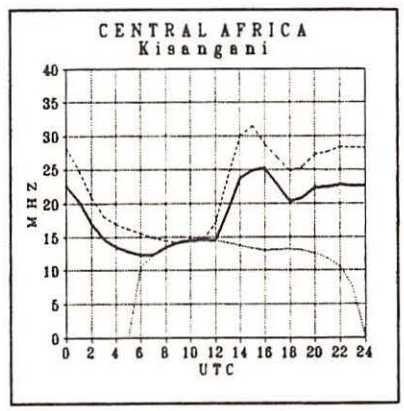


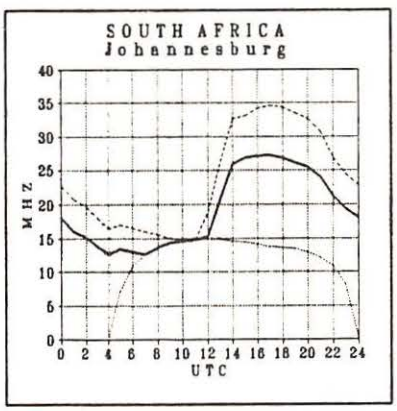


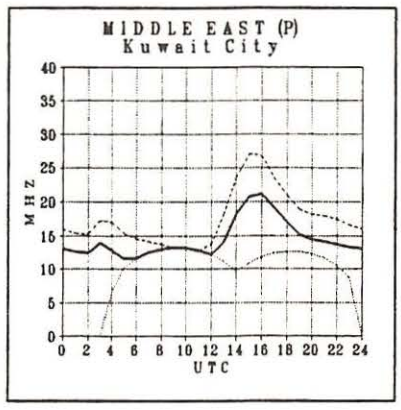


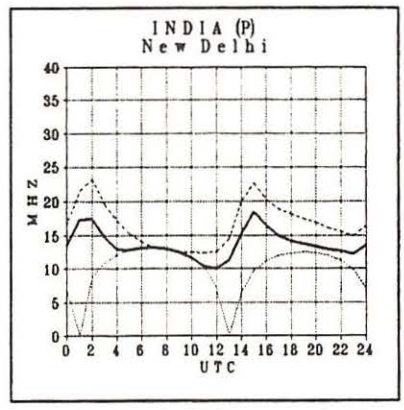


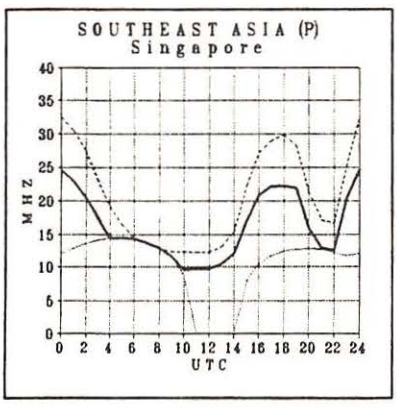


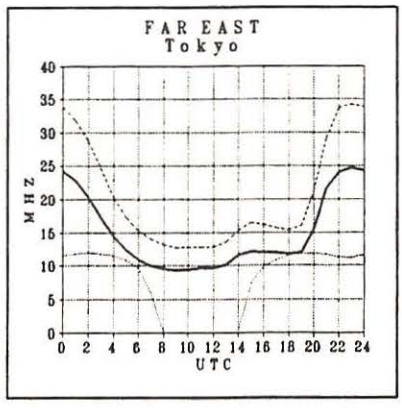


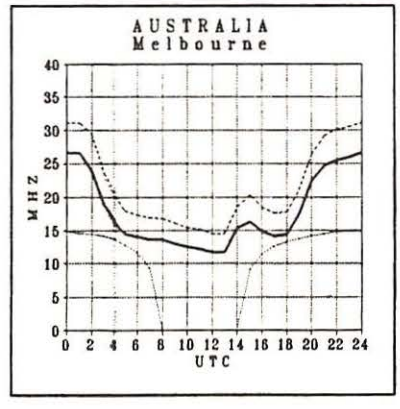












what's new?

Larry Miller

Very Hot LA DXing

It is probably one of the best, most exciting DX books published. Produced by the Japanese club Radio Nuevo Mundo, *LA DXing* (No. 5) is a comprehensive guidebook for both novice and serious DXers interested in Latin American stations.

This is no pompous, quasi-academic collection of incomprehensible esoterica. It's good reading, containing fascinating profiles of stations based on actual visits to the facilities — I counted over 40 (two were actually Caribbean stations) — that include interviews with personnel, first-hand experiences, and more.

There are also articles of all shapes, sizes and content, including a DX guide for beginners, DXing Peru, Bolivia and Venezuela, pirate broadcasting in Colombia, historical pieces, plus frequency guides galore. In short, this book is a must; one, if not "the," hottest title of the year. And it puts American "me too" versions to shame.

I give Radio Nuevo Mundo's *LA DXing* the highest possible endorsement: an unqualified "get it." You can get your copy by sending $15.00 (cash, or international postal money order — no personal checks) to Tetsuya Hirahara, 5-6-6 Nukui-kita, Koganei-shi, Tokyo 184, Japan. Tell them that *Monitoring Times* sent you.

Trouble in the Air

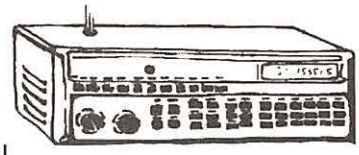
Certainly some of the most exciting monitoring experiences to be found on a radio come from the air — airplanes. Communications run the gamut from the daily drama of the to-and-fro at major metropolitan airports around the country to the life-and-death drama of a big Boeing 747 in trouble at 35,000 feet.

Laura Quarantiello, editor of *National Scanning Report's* "Scanning the Skies" column and herself a licensed pilot, has put together a complete guide to monitoring aeronautical communications. Called *Airwaves*, the big, 8-1/2 x 11 inch book covers virtually every aspect of aeronautical monitoring, from take-off to landing. Every frequency range is explored and explained, terminology is de-mystified and there are quick tips on where to listen for the hottest action.

Airwaves: The Complete Guide to Aeronautical Communications is available from DX Radio Supply, P.O. Box 360, Wagontown, PA 19376; 215-273-7823; $17.95 plus $2 book rate or $3.50 UPS.

Up Close and Personal

Today's shortwave receivers are complicated affairs. Take a look at the features list on the new Grove SW-100! Unfortunately, no matter how state-of-



the-art a receiver is, you won't be getting your money's worth unless you understand the capabilities of the receiver.

Inside Your Shortwave Radio is a new book by Ted Benson, WA6BEJ, that, literally, takes you on a walking tour of a shortwave radio.

Benson looks at several types of receivers and explains, in layman's terms, just what SSB is. Tuning systems like PLL or ECSS are broken down into easily digestible chunks. And such well-known — but seldom understood — things as IF filters, passband tuning and IF notch filters are explained.

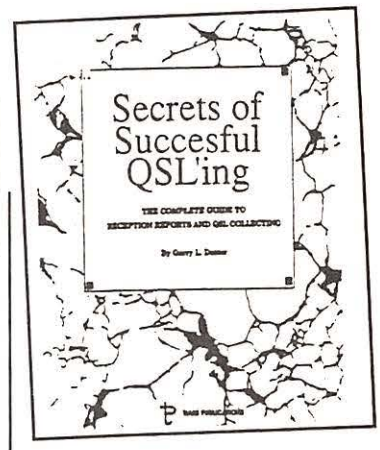
Getting information like this will undoubtedly be like lifting a veil from the eyes of many radio hobbyists. After all, said one wise man, knowledge is the first step to understanding. Understanding, he continued, is the first step towards utilization.

Inside Your Shortwave Radio is available for $14.95 from Tiare Publications, P.O. Box 493-MT, Lake Geneva, Wisconsin 53147. Shipping is $2.00.

Successful QSLing

One of shortwave's enduring classics, *Secrets of Successful QSLing*, is now in an updated 2nd edition. *Secrets*, which made available for the first time the personal library of tips and tricks from America's foremost expert on QSLing, Gerry Dexter, is now bigger and packed with even more information.

Besides his own treasure trove of hints, in this edition Dexter has turned to other prominent QSL hunters for their insights. The stories are great. (Last issue's most talked-about story was how one DXer, visiting a small station in Latin America, asked why the station didn't QSL. After using the bathroom, he found out: unanswered



reception reports were being used as toilet paper.)

Also included is a special chapter on preserving QSLs from Jerry Berg. Berg shares a number of pages of rare QSLs from the collection he curates on behalf of hobbyists.

Secrets of Successful QSLing is $12.95 plus $2 shipping from Tiare Publications, P.O. Box 493-MT, Lake Geneva, Wisconsin 53147.

Official NRC AM Radio Logbook

This is the time of year when the AM broadcast band comes into its own, and for fascinating DX few bands can beat it. This year, as in past years, the pros will be turning to the latest edition of the *NRC AM Radio Logbook*. Now in its 13th year, it contains up-to-the minute information that's specifically designed for anyone prowling the 540 to 1600 kHz range. Stations are first arranged by frequency with call letters listed alphabetically. Additional information, such as address, phone number, format, slogans, power, schedule and more, is included with each listing.

Additional tools for the DX arsenal include an exhaustive cross reference by city, a cross reference by state and a cross reference by call letters — all potent information in helping to identify that elusive station or just for casual listening. There's even a section on AM stations with stereo capabilities and, for

QSL card collectors, a list of verification signers.

Others have tried to imitate the *NRC AM Radio Log* but the original is still, by far, the best. It continues to be the reference of choice of those who ply the AM broadcast band. You can get your copy by writing to the National Radio Club at their new address: Box 164-MT, Mannsville, New York 13661. The price is $19.95 postpaid.

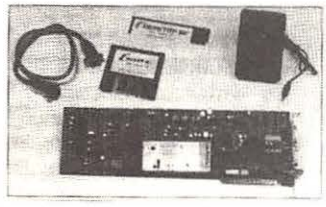
Directory of Radio Talkers

Talk Shows and Hosts on Radio is a 200-page directory covering more than 700 locally produced and network radio talk shows in major markets and small towns across the country. It's designed, say its publishers, for "a wide range of radio professionals and personalities, advertisers and publicists, `talk show junkies' and casual radio listeners."

No doubt the book is an ambitious project and it is interesting. Arranged by state, it gives the city, call letters, address, show titles, topics, and more. There are also profiles of show hosts, although they often sound like they came directly from publicity releases. While all of this may indeed prove helpful — especially the cross reference by show topic — there are major oversights.

Looking through the Philadelphia, Pennsylvania, listing, I saw only WHYY, the public radio outlet, listed. Missing was 24-hour-a-day talk show FM'er WWDB and WIP sports talk. Also missing were the myriad Sunday morning and late night talkers carried by other stations in the market. A number of talk shows are listed under Puerto Rico but no reference to language is mentioned. Today, it is simply not wise to assume, no matter what the market, that English is the language in use.

Whiteford Press has a good idea that has real potential. And it's to be commended for doing its own research and not succumbing to the temptation to simply re-copy information from *Broadcasting Yearbook. Talk Shows and Hosts on Radio* by Annie and Donald Brewer retails for $24.95 from 806 Oakwood Blvd, Dept. MT, Dearborn, Michigan 48124.



TV on Your Computer

Imagine this: You're working late one Monday night, hacking at the next issue of *Monitoring Times*. Sure, it's the greatest job in the world. But you'd rather be watching the Eagles and the Steelers on the tube.

A company called Personal Computing Tools has the answer. With a single card that plugs into your PC/XT/AT and the stroke of a key, you can turn that nasty computer into a full feature TV capable of receiving 199 stations including VHF, UHF, cable and even a VCR. Fine tune the computer/TV for optimal viewing by adjusting the volume, brightness, contrast, tint and color, all from the PC keyboard.

Desktop TV is available from Personal Computing Tools, 550 Division Street, Department MT, Campbell, California 95008 or by calling 800-767-6728. The price is $395.

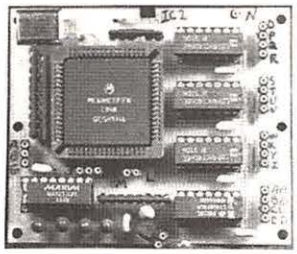
Personal Code Explorer

You use it with your personal computer. They call it "Personal Code." Manufactured by the Microcraft Corporation, Personal Code is a combination hardware/software package that allows you to read Morse code, RTTY, ASCII, SITOR/AMTOR, HF Packet and multi-level greyscale Fax signals to your computer screen. Other highlights include a real time on-screen oscilloscope and more.

Personal Code requires an 8 MHz or faster IBM compatible PC/XT/AT class computer (but will run at 4.77 MHz for all modes except packet and Fax.)

The package plugs into one of the serial COM ports on the computer and has a cable with a 1/8 inch (35 mm) plug that connects to your receiver's external speaker or headphone jack.

There are few things as exciting as seeing a "live" satellite image of the earth come to life on your computer screen or reading the latest world news as it scrolls by. Microcraft's Personal Code makes the experience possible and affordable. You can order yours for $129 plus $4 shipping and handling from P.O. Box 513-MT, Thiensville, Wisconsin 53092 or call 414-241-8144.



Smart Controller for VHF/UHF

Commtronics Engineering has designed a scanner-computer interface for the Tandy/Realistic PRO-2004, PRO-2005 and PRO-2006 programmable VHF/UHF scanners that allows you to control them by computer. A 640k IBM PC/XT/AT/386/486 or clone with 9600-baud COM (serial) port and MSDOS 3.3 and up is required.

Some of the features of the HB-232 include autoprogram, which can download to the scanner up to 400 memory channels at a time from a database; autologger, which records new frequencies discovered by the scanner; an anti-birdie device; pull-down menus and more.

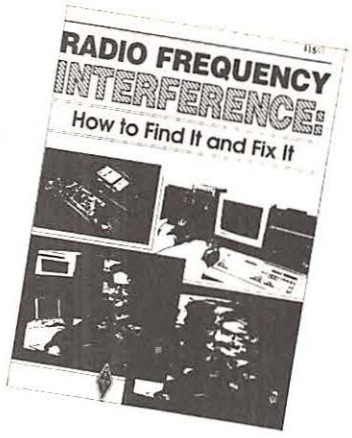
HB-232 is a kit including PC board and essential parts, program disk and detailed instructions available for $169.95 plus $5 shipping and handling. Allow 2-4 weeks for delivery.

You can get more information or order one by writing to Commtronics Engineering, P.O. Box 262478-MT, San Diego, CA 92196-2478 or call 619-578-9247 from 1:30 pm to 5:30 pm Pacific time.

Radio Frequency Interference

As our electronic society grows, so does electrical interference. Computers, small appliances, lighting systems, legal and illegal transmitters, thermostats...the list of offending devices seems endless.

But take heart; there is a cure



for virtually every interference ailment. Some of them have to be stopped at the source (always the best), while others can be thwarted at the point of reception.

Lavishly illustrated and professionally written and printed, *Radio Frequency Interference* is the most comprehensive book presently available on the subject and includes vehicle noise suppression as well as home and office. A separate chapter on radio direction finding presents easy and effective projects for RDFing all frequency ranges.

Shielding, filter design and construction, chokes, noise locating and even legal discussions are presented for the alleviation of most types of unwelcome signal interference.

There is even a free "perk" available from the ARRL. Send $1 postage to the League's Technical Department Secretary and request the "RFI Tips," an excellent collection of reprints and lab notes for curing interference of all kinds.

Radio Frequency Interference is published by the American Radio Relay League (225 Main St., Newington, CT 06111) and is $15 plus $3 shipping from the ARRL, Grove Enterprises and other ARRL dealers.

DC Power Outlet

A nice source of DC power can be a real asset in the radio room, especially a multi-outlet source. MFJ has announced the introduction of their "deluxe" DC power outlet. It's called "deluxe"

because it has a voltmeter, switch, and fuse plus eight 12-volt terminals. A heavy duty master power switch controls operations and a 15 amp fuse provides the protection. The price of the MFJ-1116 Delux DC Power Outlet is $44.95.

Get yours by calling 601-323-5869 or by writing to P.O. Box 494-MT, Mississippi State, Mississippi 39762.

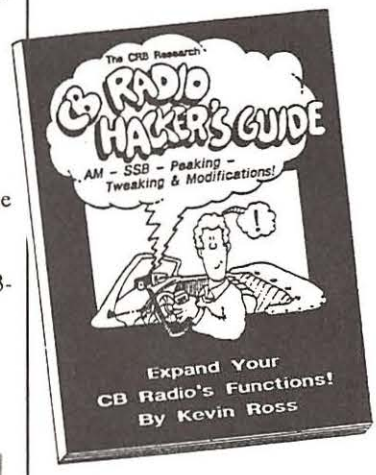
DC Power Outlet #2

Another 12-volt power supply comes from Daiwa and is called the PS-50T. This 5 amp low-capacity power supply has a cigarette lighter plug and comes without a meter. It's an excellent 12-volt source for handheld scanners, mobile units and hand held transceivers. The PS-50T is rated at 13.8 volts, weighs 6 pounds and measures a mere 6 x 3 x 8 inches. Call Electronic Distributors at 703-938-6911 for the name of a dealer near you. Be sure and tell 'em *MT* sent you!

The CB Radio Hacker's Guide

There has been a significant resurgence in interest in CB radio and those who love it are a growing, dedicated — and enterprising — bunch. Like shortwave and scanner listeners who are forever tweaking, testing and experimenting in order to get the most out of their radios, so are CBers.

The CB equivalent to Bill Cheek's wildly popular scanner



modification handbooks, the *CB Radio Hacker's Guide* is perfect for peaking, tweaking and modifying some 200 AM and SSB CB radios.

Kevin Ross, the book's author, is a skilled and innovative CB technician. As the book's forward says, "countless CB rigs have crossed his service bench, arriving as wimps and leaving as King of the Band." Information is presented in a way that even "all thumbs" operators can follow. Unlock hidden functions the factory never activated. Add all sorts of features and capabilities. Tweak existing circuits so that they perform at their maximum potential.

You can get your copy from CRB Research for $18.95 plus $3.50 shipping at P.O. Box 56-MT, Commack, New York 11725.

SW-100 Update

The new Grove SW-100 general coverage communications receiver has drawn considerable attention. A tentative production date has been moved from late October to December due to a number of improvements.

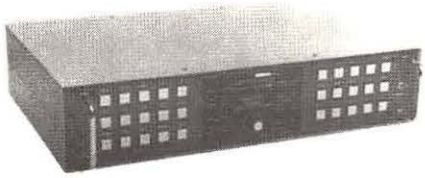
The SW-100 will include 1000 channels of memory, banked memory channels, autosearch, provision for optional mechanical filters, enhanced styling and a number of other features — all at no extra charge.

Grove Enterprises suggests that interested customers place their orders early; a delivery backlog is expected due to pre-production sales.

Review

By Jack Albert, MT RTTY Columnist

The Universal M8000 Decoder



I knew it was just a matter of time before Universal/Infotech would replace the M7000 and this time, they got it right! At first glance its facade bears a close resemblance to the M7000. In fact, both units measure approximately 16-3/8" wide, 3-1/2" high and 10-3/4" deep. But on a closer inspection, you can see that the M8000 uses a custom made keyboard with appropriately marked keys. I still find myself fumbling for the keyboard reference card on my older M7000, because I have forgotten which button changes the IOC.

Another improvement is the M8000 video interface, which requires a standard VGA monitor. I used a Goldstar GT3028 super VGA interlaced with .28 dot pitch (Sam's Warehouse for $299.95). I also used my Hewlett Packard Desk Jet printer with an HP 22707E Epson FX-80 printer emulation cartridge. The printer can produce the same quality Fax printouts using the M7000 or M8000.

Out With the Old and In With the New

After disconnecting the M7000, hookup was easy. Except for the tuning scope and the "IN 2" jack, the M8000 uses same 1/4" audio connecter. The "IN 2" jack requires a 1/4" stereo plug and provides audio to the dual diversity HF input and the digital paging audio. I had to make up a new tuning scope cable using a 15 pin sub-D connector. I then slipped the unit into the pigeon hole that had housed the M7000.

Seeing is Believing

I turned on the monitor and the M8000 and I couldn't believe my eyes! It displayed a status line in color using high resolution graphics and characters. The screen was quite pleasant to the eyes and even without my glasses I had no problem reading the white text on a black background.

A window above the status line at the bottom center of the screen displays a spectrum analyzer similar to the one that is used in the Hamcom software. To the right of the window are five colorful, horizontal bargraph displays used for setting the audio level.

Hurrah for Piccolo!

Being a pioneer (the first hobbyist in the US to build equipment and copy Piccolo), I had to check out the reception! You simply press the mode button until you see PICCOLO in the status line. The M8000 displays the spectrum analyzer with six markers. Tune the receiver until the six piccolo tones are aligned to the markers. If your receiver tunes in 10 Hz steps, you can fine tune the filters in 1 Hz increments until the pips are dead on the markers.

I found that the MK SP LEDs speed up the tuning process by rocking the receiver dial until they both flash. If the channel is sending "idle" tones #5 and #6 you should align the pips to the two inner markers. By pressing the N/R and the tune button, the Piccolo signal will come into sync and you should be able to copy readable text. Like the ARQ modes, Piccolo is usually idle on the order wire channel and you may have to wait a while before you can copy any text.

Other modes that are carried over from the M7000 include ARQ-E, ARQ-E3, ARQ-S, FEC-A, FEC-S, SWED-ARQ and of course RTTY, ASCII, Packet and Fax. The unit can even copy digital paging, but I would recommend not using the POCSAG or GOLAY modes because you may violate the ECPA.

Fax Outshines Them All

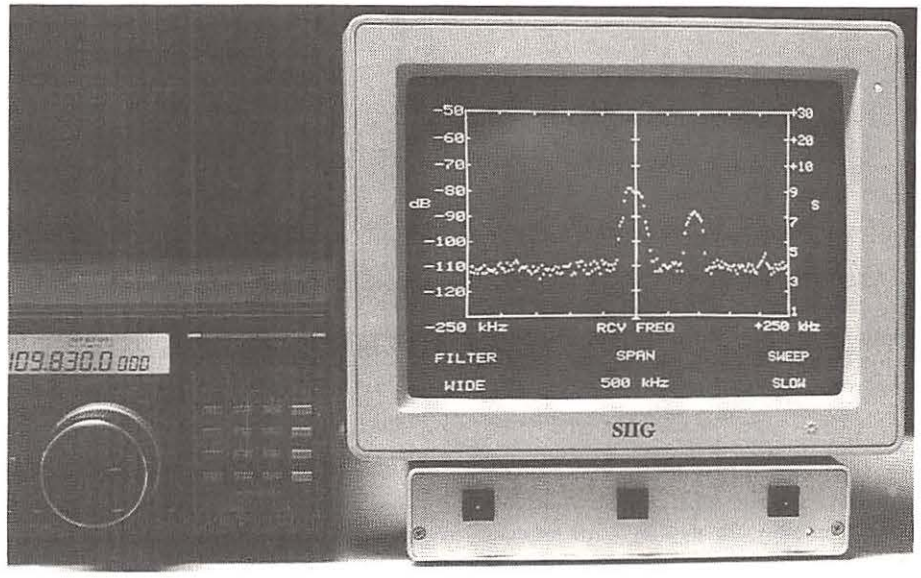
With the high resolution monitor and the multiple grey scales, the M8000's Fax mode outshines any unit on the market. I copied a few satellite photos that were rebroadcast on HF. The video display was fantastic—the clearest HF Fax photo I have seen to date.

The Universal M8000 Decoder retails for $1399.95 and is available from Universal Radio as well as other *MT* advertisers.

Editor's Note: The procedures detailed in this book are unlawful to perform. The text is intended for educational purposes only. Monitoring Times assumes no responsibility for any liability which may result from the implementation of its contents.

Bob Grove, WA4PYQ

Grove SDU-100 Spectrum Display Unit



While attention has been focussed on the new Grove SW-100 general coverage communications receiver, Grove Enterprises has been quietly developing a powerful new tool for signal intercept and monitoring.

The SDU-100 in conjunction with a companion CRT monitor turns any receiver or transceiver with an IF output jack (Icom R7000, R7100, Grove SW-100 and several others) into a spectrum analyzer. And, like the previously announced SW-100, the new SDU-100 is 100% American designed and manufactured.

A video display presents a visual image of a portion of the radio spectrum up to 10 MHz wide, showing signals present in real time. The "spikes" inform the user of the relative signal strengths and approximate frequencies of these off-frequency transmissions so that the listener can decide whether they are of interest, then quickly tune them in.

Spectrum analyzers are of enormous use to professional monitors; rather than wait for the slow search of a scanner to uncover new signals, often missing transmissions during the process, a spectrum analyzer immediately shows signal presence; a quick turn of the receiver's tuning dial nails the target.

Countersurveillance teams, private investigators and federal law enforcement officers regard the spectrum analyzer as the leading weapon in detecting eavesdropping transmitters ("bugs").

Until now, spectrum analyzers were bulky, heavy, expensive and limited in their receiving capability. The Grove SDU-100, however, turns any quality receiver or transceiver which has an IF output jack into a powerful signal detection tool.

Connecting it up

The SDU-100 can be connected to any TTL monochrome monitor like the optional matching VID-100 9" CRT monitor. The SDU-100 itself requires 12-14 volts DC power so that it can be operated in a mobile or field environment. An AC adaptor is provided with the unit, and the VID-100 is AC powered (12 volt DC monitors are available).

The SDU-100 is configured to operate with a variety of receiver intermediate frequencies (IFs), including 8.8, 10.7, 21.4, 45 and 70 MHz. This must be specified at the time of order. An inexpensive plug-in module can be ordered later to change the IF if desired.

An RCA phono plug on the rear panel is used to connect to the IF output port of the host receiver.

Features and Specs

Three pushbutton "softkeys" permit instant selection of display characteristics; the choices are shown on the video screen along with the spectrum display. Most users will elect the auto mode; functions are automatically chosen for every span.

The span (width of spectrum displayed) can be selected from among 100, 200, 500 kHz and 1, 2, 5 or 10 MHz with a linearity (accuracy) of better than 10%. Data are digitally stored and refreshed constantly.

A 0 span selection places the SDU-100 into a time-domain (oscilloscope) mode, allowing the tuned signal to show its intensity over time (up to 5 seconds). This is handy for watching a moving target or for making comparative adjustments on an antenna or transmitter.

Two resolution bandwidths (5 and 30 kHz) and four sweep rates (0.1, 0.5, 2 and 6 seconds) are selectable manually if desired.

The signals are displayed in true logarithmic fashion, with 3 dB accuracy and over an 80 dB dynamic range. The vertical scale is calibrated both in S units and dB.

Input sensitivity is adjustable from -130 to -50 dBm, more than adequate for any receiver or transceiver.

The display is quite stable; a centering control is unnecessary. Should the factory-adjusted center frequency not match the receiver, a simple adjustment will correct the display. There is even a softkey procedure for centering if the receiver IF drifts, but its setting is lost when the unit is shut off.

The SDU-100 measures a compact 7-1/2"W x 1-1/2"H x 9"D, providing a matching footprint for the companion video monitor.

The screen trace has a slight "dot matrix" appearance due to its digitization, rather than the continuous smooth line of an analog CRT, but this is a small price to pay for the full features of this low cost spectrum display unit.

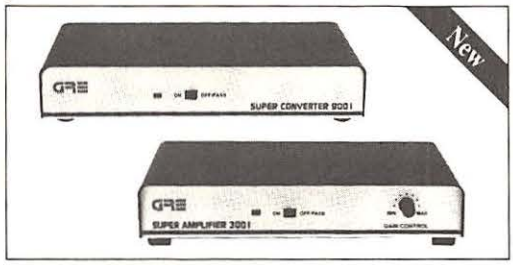
Demand for the Grove spectrum display system, due for release within the next 90 days, is expected to be heavy, both from the consumer and government markets. Reserve orders are being taken now.

The SDU-100 spectrum display sells for $499.95; the VID-100 monitor is $149.95. They may be purchased together for $599.95 plus shipping from Grove Enterprises (PO Box 98, Brasstown, NC 28902) and authorized Grove dealers.

MT

Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



Super Converter 9001 & Super Amplifier 3001

Super Converter II

Super Amplifier

All-Band Antenna

U.S. & International Distributorship inquiries welcome. Please call GRE for further information!

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ATTN: MOBILE SCANNER USERS

Introducing...
the
Realistic® PRO-2026

Realistic® is a registered trademark of the Tandy Corporation

Everyone that has used a mobile radio knows how difficult some can be to program while driving. A touch of the button starts an instant search of hundreds of Police, fire, aircraft, marine or weather channels in your location.

Built for Realistic® by Uniden, the PRO-2026 looks like the Bearcat 760XLT, but is intended for mobile use only (includes mounting bracket and 12 VDC cable). The 2026 includes 100 memory channels in 5 banks. The audio is clearly heard from a 3" bottom-mounted speaker, even in the noisiest of mobile environments. With high sensitivity, sharp selectivity and a compact design, this new mobile radio races into vehicles with ease. The BNC connector attaches easily to mobile antennas like the Grove ANT-4.

The 2026 has frequency ranges from 29-54, 108-174, 406-512 and 806-956 MHz (less cellular telephone). The scan speed is a respectable 14 channels per second and search speed runs by at 19 channels per second. Search increments are 5 kHz in the 29-54 and 137-174 MHz bands and 12.5 kHz elsewhere.

The PRO-2026 is now available from Grove for only $189.95*! Call today and hit the open road with your new mobile powerhouse.

Order SCN16 Today for only $189.95!*

* Plus $7.50 UPS shipping

VISA MasterCard DISCOVER

CALL TODAY FOR OUR CURRENT CATALOG!

Grove Enterprises, Inc.
1-800-438-8155
140 Dog Branch Road
Brasstown, NC 28902-0098

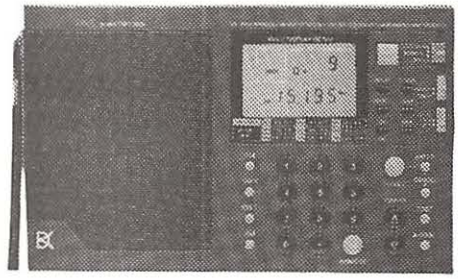
Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

• DAK's New Feature-Filled Portable
• Sangean Promises Ribeye Portable at Hamburger Price

How does Drew Kaplan do it?

That's what people have been asking ever since DAK—named for its leader, Drew Alan Kaplan—released its first $50 digital portable, the MS-101. That was soon replaced by an improved model, the MS-101S, and already that model is apparently in the process of being dumped for $39.90, while supplies last.

If you're looking for something digital in the rock-bottom price range, grab it. For, as we found out, DAK's new $69.90 DMR-3000 digital portable is a worse performer than the cheaper '101S.



Incredible List of Features

At first glance, it's hard to believe the '3000 is anything but the answer to a thrifty shortwave listener's dream. Features abound: digital frequency display in XX.XXX MHz format, keypad tuning, up/down frequency slewing, 36 presets (18 for shortwave), rudimentary scanning, an alarm, sleep-off delay, a timer, illuminated display, two clocks, FM stereo through earphones and, just to make sure you can take it abroad, a 9/10 kHz adjustment for AM channel spacing. This receiver even looks good.

Incredible? You bet! There's never before been a receiver with features such as this at anywhere near that price. And if this is not enough, the '3000 is straightforward to operate, and one performance variable—selectivity—is better than we've come to expect from a cheap radio.

So, how does Drew Kaplan do it? By sacrificing performance, and it's some sacrifice.

Where are the Stations?

For starters, the set does not tune the 9350-9495, 13600-13800 and 15000-15095 kHz portions of the spectrum, where there are numerous juicy broadcasters chattering away.

Okay, for seventy bucks you don't expect brass knobs and buttons that glow in the dark. But when you tune 9 MHz (the 31 meter band) and to some extent 11 MHz (the 25 meter band) you realize immediately there is something terribly wrong: Hardly any stations come in. Signals that are loud and clear on most other portables just aren't heard, or are whispers buried in a whirlpool of circuit hiss. At night, when most people listen, the 9 MHz band at most points in the 11-year sunspot cycle is arguably the most active and important shortwave band. With that band hardly functional, 13 MHz not covered at all, and 11 MHz—another choice band—sputtering along, what you find is that you have a radio that's able to strut its stuff at night only on the 6 and 7 MHz bands.

Fortunately, by day things improve, as performance in the 15, 17 and 21 MHz bands is quite reasonable. If the set covered all the bands, as it should, and did so as well as it does within the 6, 7, 15, 17 and 21 MHz bands, it would be a bargain, indeed. In these fortunate bands, the only significant flaw is in image rejection, which lets through a fair number of "ghost" signals—RTTY and the like—to bother the station you're trying to hear. And dynamic range that is marginal, indeed.

"Station Stalker" Antenna Accessory

In principle, DAK already has an answer—its optional "Station Stalker" active antenna accessory, another el cheapo at $29.90. Alas, we found it does little to bring moribund bands to life, but it does add to the complexity of operation and brings the price of the unit up to $100. That's within nose-rubbing distance of Radio Shack's $119.95 DX-370 or the Sangean ATS 800, which are decidedly better performers.

Where Does DAK Go from Here?

What the future is for this radio is hard to say. On one hand, DAK's initial MS-101 had significant drawbacks which were alleviated in its next incarnation. Quite possibly engineers will be ordered back to their drawing boards to produce an improved DMR-3000 in due course.

The other side of the coin is that DAK recently went into Chapter 11 creditor-protection status. And it shows. When we ordered our DMR-3000, we were explicitly told it was in stock and would be shipped immediately. Instead, weeks later we received a postcard telling us the product was on backorder. We got the radio eventually, but taking customers' money under false pretenses and holding it to obtain a "free loan" is an odious practice. We mentioned this in an earlier issue of *MT*, and heard from some readers that they, too, have had similar experiences.

Can a firm that's so clearly on the financial ropes come up with the funds to produce another model?

DAK has to be commended for hammering away at the notion that shortwave radios must have lofty price tags to be acceptable. Truth is, most shortwave radios have been overpriced for some time, now, with manufacturer's profit margins well in excess of those found in most other areas of consumer electronics.

Prices, indeed, should come down. But not like this.

Up and Coming

A number of new portable and tabletop models are promised for the months ahead, but arguably the most interesting is Sangean's forthcoming ATS-606. Sized for travel, it's billed as being similar to their better sets, such as the ATS-808, but smaller—at half the price. Common sense tells us that somewhere there has to be a catch, but perhaps this will actually be the first true "traveler's Volksradio."

We'll let you know.

MT

had a radio that appeared to be at least 20 years old. I asked him, 'Is this Vietnam era?' 'Earlier than that' was his reply."

Brian's question reminded him that it was probably time to change the battery of his portable transceiver, and Brian encloses the picture.

Gene Hughes of *Police Call* muses that the riots proved how badly the city needed the new communications system twice turned down by LA voters. "Not enough frequencies, equipment, or personnel. Proper radio procedures were ignored. Overworked RTO's lost their cool and let frayed nerves show. But in spite of what happened, voters will turn the bonds down again. The vote should have been taken during the rioting."

WWV and WWVH

Peter Stawicki's question in August regarding the announcers for WWV and WWVH has aroused so much interest, we decided to publish *MT*'s tour of the station while the subject is hot! But here are a few details Wayne Heinen didn't cover:

From Kent Graybill, Spokane, WA: The principal audio tones broadcast are 600 and 440 cycles-per-second. This is pretty important to every musician in the world because 440 cps is the international standard for A above middle C, at least in our Western 12-note scale. "A" notes are all an even number of cycles-per-second, i.e. 220, 440, 880, etc. Actually, there was no international standard until 1939. My guess is that's when WWV started broadcasting it, though I don't know that for sure.

From Herbert Newberry Jr, Mansfield, GA: Jane Barbe, the voice used on WWVH for years, is also used by Bell Telephone to provide digit-by-digit response when calling Information for a telephone number. Don Elliott Heald, for years the voice on WWV, also provided the voice of our local telephone time and weather here in central Georgia.

Herbert adds, "I put your magazine through several readings a month and it's open to the 'Shortwave Guide' whenever the DX-440 is fired up. Very accurate. I also remove the propagation chart and post it next to the radio so I can quickly check conditions. It has saved time and let me DX where the DXing is best."

Not only do propagation charts help, but so do the solar index broadcasts by WWV/H at 18 minutes past each hour. Dave Rosenthal, who contributes to Radio Netherland's "Media Network," called to recommend a new users guide he helped put together to interpret that information. Its full name is "The Radio Frequency Users Guide to the SESC Geophysical Alert Broadcast." Request publication #ERLRSEL 80; Space Environmental Services Center, R/E/SE2, 235 Broadway, Boulder, CO 80303.

Dave also said the new voices used by WWV and WWVH are Eric Smith and Gretchen Stahl; Eric Smith must have been the interim voice who is being replaced by John Doyle, as explained in the feature article.

Shorts

Here are a few comments from other reader correspondence:

• From Bob Thomas, Bridgeport, CT: A panel discussion, call-in program on HCJB discussing integrity, purpose, money campaigns, and styles of Christian religious broadcasting, mentioned Bob Grove's back page editorial on religious broadcasters and subsequent reader comments. Bob was called "an honest magazine publisher."

• From Ken Gardiner, Yorkshire, England: I should like to suggest that it would be a great help to us foreigners if advertisers and reviewers of books were to include overseas postage in their copy—as Tiare Publications already does.

• From Dale Wagner, Margate City, NJ: Sorry, but it's just not good editorial policy ("unethical") to put paid ads right next to editorial material praising the product for sale. Two recent occurrences are Max Antenna and PRO-43 in August *MT*.

• From Eric Walton, Vancouver, BC, Canada: Persons sending a self-addressed-stamped envelope to another country for a reply should ensure they either use stamps *for the country concerned*, or international reply coupons, or US currency.

September Corrections

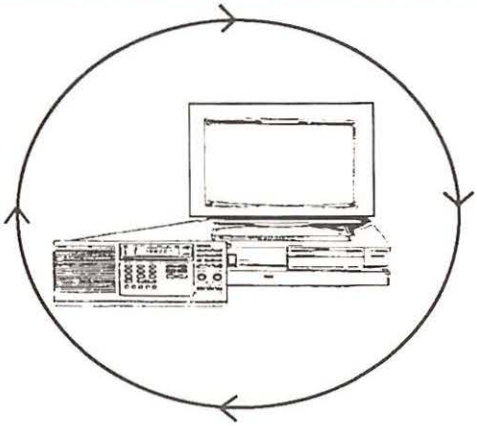
An odd error was made in a quote from BBC Deputy Director David Witherow. He said that "We don't want the *world service* to neglect the cultural and high entertainment programs..," not "tabloid service" as was printed.

We are indebted to Edouard Provencher of Biddeford, Maine, for pointing out another mistake. We apologize for apparently reversing the captions under HCJB personnel John Adams and Rich McVicar "in the otherwise great article on being a shortwave broadcaster by Ken MacHarg."

Thanks to all of you who have taken the time to send in your comments, clippings, ideas and opinions. Next month we'll catch up on some more letters, including some comments on providing publicity to pirate radio. Until then, may all your monitoring times be good ones!

Rachel Baughn, Editor

John Catalano



Coming Full Circle

If you have been following this column since its introduction last September you will remember we started with the concept of a "total monitoring environment"—a computer program from which you can perform any and all actions required in our hobby. When you combine the wide range of monitoring possibilities with the range of our individual interests, this is a tall order indeed. Perhaps that's what makes monitoring an ever-changing source of pleasure. Because of the personal nature of the hobby, I chuckle when another "expert" writes the definitive book on how exactly to enjoy monitoring. Perhaps what they really mean is how they enjoy the hobby. It is almost like a person writing a book on the best sandwich filling in the world and how it must be eaten to be enjoyed!

With all its combinations of technical potential, program media and personal preferences, monitoring is truly a movable feast. So how can we define this total environment? Well, some elements are basic to *all* monitoring: Control of the radio functions, decoding of various signal modes and storage of monitoring details for future use.

In the first few columns, we reviewed commercially available software which addressed this need. Then we looked at other sources of software and programs which, although not directly fitting into the total environment approach, added support information useful in monitoring. Responding to your requests, in last month's column we looked at our basic needs from the computer hardware (and budget) point of view. This month we come full circle with a review of 801HF - Receiver Control and Scanning System, VERSION 1.0. The title of 801HF pretty well defines its intended functions.

801HF, from Terzon Systems Inc., has its roots in another Terzon product, 801SCAN. 801SCAN was designed for the ICOM R7000 and R9000 VHF/UHF receivers. I remember seeing the advertising for this program because it was one of the first commercially available software packages. Their latest product, 801HF, extends the user interaction and methods developed for scanner monitoring to shortwave listening, hence the HF for high frequency. How does a product originally made for VHF/UHF monitoring work on HF? Let's see.

801HF requires an ICOM R71 with a UX-14 accessories board, an IBM PC compatible with at least 512K of ram and a serial (RS232) port, DOS 2.0 or later and either Terzon's or ICOM's RS-232 converter/interface. The program can run on any and all monitors. Those are the basic requirements. However, to take advantage of all of 801HF's potential, a second serial port in your computer, a hard drive and a digital signal decoder, such as a PK-232, are recommended.

Starting the program could not be simpler. Typing the name brings up a full function screen from which all features of the program can be accessed. All the information to use the program is at your fingertips without having to fumble with paper manuals. For those of us who use a spreadsheet such as LOTUS, the screen is very familiar with the major commands positioned across the top of the screen and chosen via the left and right arrow keys. Below this "menu area" is a status window where monitoring information is displayed and controlled.

Finally, the lower half of the screen is referred to by Terzon as screen form and function-key legend area and is unique in its form and operation. Although the major functions, such as Exit, can either be chosen by the arrow keys or their highlighted letter, the receiver operational commands, such as scan rate, are selected via the Function or F keys. With ten F keys (F1 to F10), each expanded by the Shift and Alt keys, the possibilities explode to thirty possible combinations! But the people at Terzon have done a very fine job by building in all these features and making them easy to get to without having to memorize a dictionary of keystroke commands.

All the possible commands, including associated help screens for each of the commands and functions, are listed in this lower portion of the screen. Arranged in graph form with the function key number in the left hand column and the Shift, Alt and Normal across the top row, the way to access a feature is always right in front of your eyes. Find the feature you want to use, and then hold down the appropriate key (Shift, Alt. or none). That column becomes highlighted on the screen. Then press the F key at the extreme left row of the desired feature, and you will be in that function or feature.

It's as easy as reading a bus or train schedule, but without the page flipping. At any time, with one exception, you can get back to this main screen by pressing the escape key, so you can experiment with all the keys without the fear that you will somehow be transported into uncharted and unrecoverable program territory. If you've been there with other programs (and probably met me there) don't worry when using 801HF; I couldn't make that happen, thank heavens and Terzon. The one screen that does not use the escape key to exit it—TermUnit—clearly states at the bottom of the screen what keys are used to return to the main screen.

Let's dig into some of these main commands to see how they are used. Many are self descriptive and require little explanation. EXIT exits the program and returns you to DOS. TermUnit displays the decoded output of your terminal unit, such as a PK-232. PARAMS is the command used to set ranges of receiver parameters, such as the range of frequency choices for scanning or searching and the range of scan delay times.

Notice I've said "ranges." A very convenient feature of 801HF is that the operator can chose parameters, such as his receiver's scanning frequency step, with one keystroke, "on-the-fly" from the main operating screen. No stopping your DX chasing and no piano-playing keyboard actions are required, leaving you to concentrate on monitoring, NOT computer-jockeying. This ease of changing receiver parameters is one of the most attractive features I found in 801HF and lacking in most similar programs. PARAMS is also used to set the program's time clock to the local time zone, and to set all interface parameters for the computer and the receiver.

If you are not sure of what is meant when asked to enter data by the program, pressing the F1 key usually brings up a short, but descriptive, help screen explaining what is required. This HELP features works very well and will allow you to be using 801HF quickly.

TEXT is used to convert word processor text files containing station data into frequency lists that 801HF reads, understands and uses to control your radio. The opposite is also possible; you may convert 801HF data that you have collected into readable word processor reports. I have tried these text-to-frequency conversions with other monitoring programs and found the process is rarely straightforward, requiring experimentation and time. 801HF is no exception, but the HELP function makes the task a bit easier than other programs.

The FIND command is used to sort through your "channels" and find matches to your request. For example, you can request it to find a given frequency, or a word in your channel description.

NotePad, another main command, invokes a text database organized by frequency and allows you to input 25 lines of text for each frequency with up to 500 frequencies per database. Very nice! This is one of the few programs which takes our handcuffs off by allowing more than just a few, cryptic characters (which later cannot be deciphered) to serve as a description of what we have monitored. 801HF allows the operator to generate a more useful and detailed station log. If the NotePad is placed in the auto mode, the NotePad details of any frequency on which searching/scanning stops will be displayed.

That leaves four main commands that we have not yet covered. These four are at the heart of the operation of 801HF. Are they simply and logically laid out? How are they used? What is our overall opinion of 801HF? And will Indiana Jones escape certain death? But as a famous newscaster says, what is the rest of the story? Stay tuned next month for the "rest of the story" on 801HF and an updated review of one of the pace setting standards in monitoring software. Which one? Read the first Computers and Radios column and you'll know the answer before next month.

Feedback

Before we close this month I would like to thank you for the many letters I've received suggesting topics and expressing your satisfaction with the column. I did, however, receive a letter from a reader who was very critical of my comments in June concerning shareware and public domain, and of the column's non-technical approach.

In reply, let me restate the current purpose of this column, which is to bring to our monitoring hobby a new dimension of computerization —what it can do, how it can help make monitoring more enjoyable, what software is available and how to use it. It is quite a trick to explain/teach any of the above while making the experience an enjoyable one.

In an emerging field like Computers and Radios, we all come with varying degrees of experience. One may be an expert DXer, but a novice on the computer. Another may be a beginner at both. I have an undergraduate degree in applied physics with a number of courses in computer programming and a doctorate in solid state physics (and did some formal teaching while earning it), plus twenty years of international industrial experience in computer-aided design of integrated circuits. Someone with a background like mine might not need a column like this one, but the novice can find computers, software and "computerese" to be enormously frustrating.

With this in mind, the editor and I decided to discuss things at a basic level; the more advanced could skim over what they didn't require. I also decided I had a duty to my readers to not only give them a generalized introduction to new topics or software, but also advise them of the areas that may give them trouble, since this is where most potential computer-aided hobbyists fall by the wayside and give up.

My general comments concerning shareware and public domain still stand, based on my experience with software on both sides of the commercial fence. There will always be diamonds in the rough; they should be sought out and enjoyed. But when it comes to programs currently available to the radio monitor, such diamonds are the exceptions, not the rule. Again, if chosen wisely they can be good value, but the beginner may find it a discouraging experiment.

On a more positive note, I would like to congratulate Stanley Mayo of Maine for winning the Message Catcher contest begun in May. The answers to the questions were: 1. My wife 2. Radio Control-Digital Decode-Database for control parameters and station details and 3. Baud Rate. Stanley, you will be enjoying the fruits of unattended listening with the Message Catcher from Radio Accessories very soon. Thanks to all the other entries. We will be starting another contest soon, so keep your stamps at the ready, and keep your letters and suggestions coming.

Technology, like life, is not a destination, but a journey. So here's 'til next time, when we'll continue our journey.

MT

Doug Demaw, W1FB

Build a Simple Whistle Filter

If you're an SWL DXer in the standard AM broadcast band, you have found it necessary to cope with 10-kHz whistles from strong adjacent stations. These heterodyne beat notes can be pretty ferocious when two strong AM stations are nearby and adjacent in frequency. A well designed AM receiver has sufficient selectivity to minimize the "whistle" problem, but receivers that are designed for true hi-fi reception on AM (acknowledging the bandwidth limitations imposed on AM broadcasters by the FCC) do not always have 10-kHz filters built in.

You can add your own notch filter in the audio section of your home-made or store-bought AM receiver. This article explains how to construct a simple op-amp notch filter that you can assemble on perf board or a home-made PC board in a couple of hours.

The Nature of the Circuit

Figure 1 contains the circuit diagram for a one-stage notch filter. This is called an RC (resistance-capacitance) active filter. The term "active" means simply that an operating voltage is required to make the circuit work. A passive filter, on the other hand, uses coils and capacitors and does not require an operating voltage. The active filter can have unity gain (1) or can be designed to yield a gain of 2 or 3 if desired. I prefer unity gain when my filters are to be used in a properly designed receiver circuit.

It is important that R1 and R2 in Figure 1 be closely matched in value for top performance. Likewise for C2 and C3. The resistors can be matched by means of your ohmmeter. If you don't have an accurate instrument for measuring capacitance you may use silver mica or polystyrene capacitors for C2 and C3. These capacitors are usually very close to the marked values. Also, the Q (quality factor) of silver micas and polystyrene capacitors is high, and this is desirable in any type of filter. R3 enables you to shift the notch frequency to get it "on the nose."

You will observe from the response curve shown in Figure 1 that a notch filter operates in the opposite manner from a peak or bandpass type of filter. Specifically, the notch filter rejects or blocks out a single frequency, whereas a bandpass filter peaks or enhances the response of a selected audio frequency. Hence, if the Figure 1 circuit is adjusted for 10 kHz it will practically eliminate that frequency while passing those frequencies above and below 10 kHz.

A low-cost 740 operational amplifier (op amp) is specified for U1. You may use any low-noise op amp that has the same pin arrangement. BI-FET op amps (those with FETs at the input, such as TLO-80s) are quieter devices and may produce less hiss noise in the audio channel of a receiver.

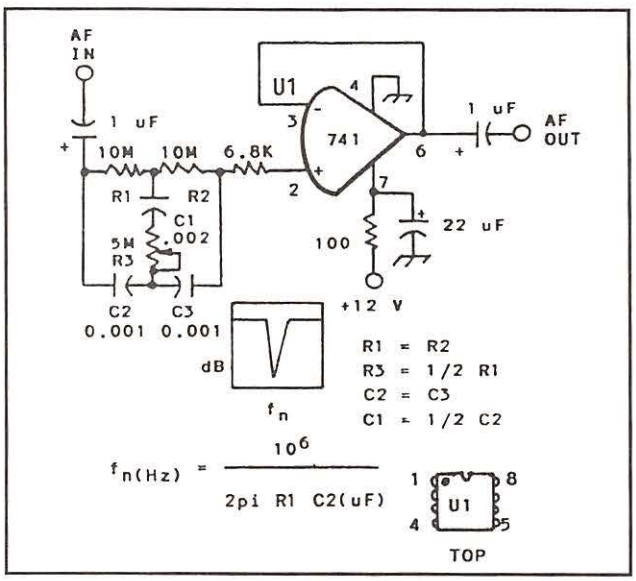


Figure 1: Schematic diagram for an RC active audio notch filter for removing heterodynes from the receiver output. R1, R2, C2 and C3 should be matched within 5% for best performance. R3 is used to vary the notch frequency. It is a linear-taper, panel-mounted carbon composition control. Polarized capacitors are electrolytic or tantalum, 16 or 25 volts.

Other Notch Filter Applications

The formula given in Figure 1 enables you to design the notch filter for any audio frequency you choose. For example, you may have a hi-fi system that has 60- or 120-Hz ac hum in the output. The filter can be tailored for those annoying hum frequencies and located in the early stages of your audio amplifier to eliminate hum. This is frequently done by designers of quality hi-fi equipment.

If you are a radio amateur who operates SSB or CW, a notch filter is almost mandatory for minimizing heterodynes from nearby amateur stations. The filter will not remove SSB splatter or sideband energy, but if someone is operating AM near your frequency you can notch out his carrier. Likewise when someone tunes up (produces a steady carrier) near your frequency. The filter is helpful for CW operators who have QRM problems from other CW stations that are close in frequency.

Better performance will result if you build two or three of the Figure 1 circuits and tie them together in cascade. This narrows the notch response curve and prevents the filter from removing desired audio frequencies near to the notch frequency. As shown, our circuit is capable of providing a notch depth of approximately 40 dB.

Construction Notes

Although we are working this month at audio frequency, it is important to keep all leads in the circuit as short and direct as practicable. Long leads tend to pick up unwanted ac hum. They may also cause the IC to self-oscillate at audio or radio frequencies.

An ideal foundation for this circuit would be double-sided PC board, with one side acting as a ground plane. The ground-plane side would be connected to the ground foils on the etched side of the board. A single-sided PC board is okay if you keep the conductors short. You may also use perf board if the wiring is short and tidy.

I suggest that you build your notch filter in a small metal box. R3 can then be mounted on the box wall for easy access. Phone jacks may be used for the input and output terminals. Shielded audio cable can be used for patching the filter into your receiver audio circuit. This will require adding two phono jacks to the back of

your receiver. When the filter is not in use you can place a short audio cable across the two phone jacks on the receiver to complete the original receiver circuit. A third phono jack may be added to the receiver and filter box to permit borrowing +12 volts from the receiver for operating the filter. You may opt to install a 9-volt battery and an on-off switch in the filter box so that the unit has its own power supply.

Installation

All you need do to install the notch filter is open the circuit between two of the early audio stages (preamplifier section) and insert the filter. The Figure 1 circuit has input and output blocking capacitors. This eliminates the need to modify the receiver audio circuit. This circuit is not suitable for use at the headphone or speaker terminals of your receiver. The component values listed in Figure 1 are suitable for the range of audio frequencies with which you will most often be working.

MT

Bill Cheek

High-Gain Power Amplifier for Low-Audio Projects

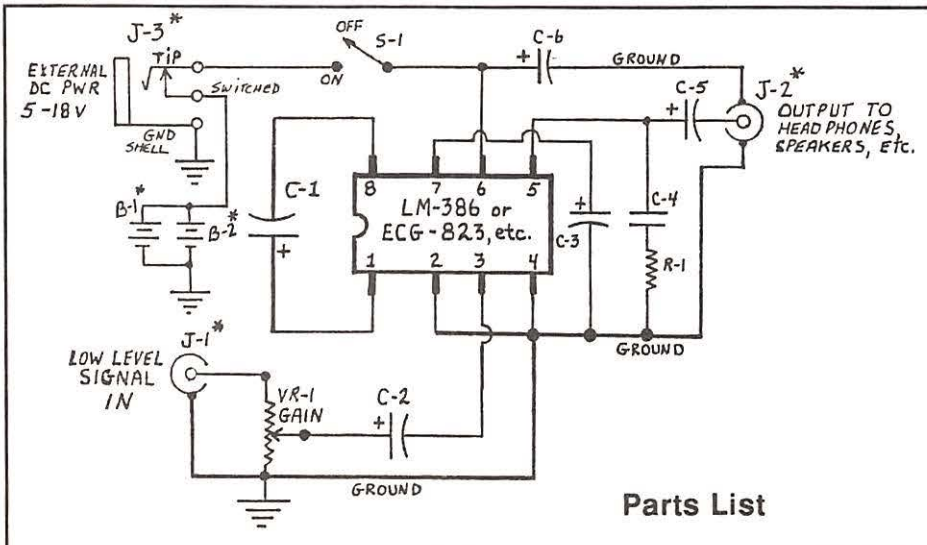
Last month we concocted a hot little low-noise, high gain preamplified microphone to use with a tape recorder. But what if you wanted to listen directly to a low-audio source such as this microphone or a crystal radio? This month's project lays out a super-simple power amplifier that's eminently suited for boosting any low-level audio signal up to monitoring levels! You might already have all the required parts!

The heart of this high-gain amplifier is the common 8-pin DIP integrated circuit, LM-386, readily available at Radio Shack and most electronics parts outlets. The LM-386 and its variant family members are used in a wide variety of consumer electronic items including handheld scanners. The LM-386 is a versatile power amplifier chip with output capability to 1-watt. The power supply can provide anywhere from 5 to 18 volts DC, with 6-14V ideal.

For ear-splitting audio, you need only a few common parts. If you're going to make a portable headset to be used with last month's preamplified mike, then I recommend one or two standard 9-V alkaline batteries (wired in parallel) for the power source. Most any DC adaptor can be used for fixed operations. You can even configure the amplifier to operate from a variety of sources—batteries, DC adaptors, automotive power, etc.—by using a switched phone jack! See the diagram and the parts list for details.

Construction of the amplifier is not at all critical or difficult. I'd recommend the use of an IC socket so that the inexpensive chip can be easily replaced if it ever blows up. The circuit can be built on a piece of perf board as small as desired, or you can dress it up into a chassis box with full sized switches, volume knobs and loads of input/output jacks to suit a variety of needs.

If you choose to integrate last month's preamplified mike into the high-gain amplifier, there are two ways to go: (1) wire them directly together into a compact, tidy container, or, as I prefer, (2) keep the two units separate, and connect the output of the preamplified mike to a length of mini-coax cable with a phono plug on the end. Then, install a mating phono jack at the input of the amplifier! This allows a variety of inputs so you're not limited to just a microphone.



* THESE ITEMS ARE OPTIONAL DEPENDING ON NEEDS

Parts List

Circuit Symbol	Description	Radio Shack Catalog No.
B1,2	Optional 9-v alkaline batteries	23-553
C1	Capacitor, 10-uF/35wvdc, electrolytic	272-1025
C2	Capacitor, 2.2-uF/35wvdc, tantalum	272-1435
C3	Capacitor, 22-uF/35wvdc, electrolytic	272-1026
C4	Capacitor, 0.05-uF/50wvdc, mylar	272-1068
C5,6	Capacitor, 470-uF/16wvdc, electrolytic	272-957
J1,2	Phono jack, 1/8", open circuit	274-251
J3	Phono jack, closed circuit (switched)	274-248
R1	Resistor, 10-ohms	271-1301
S1	Switch, SPST	any
VR1	Potentiometer, 100-k, large size trimmer size	271-1722 or 271-284
Misc	AC/DC Power Adaptors:	273-1455, -1651 -1652, -1650

Likewise, with the output, install a phono jack to accommodate a choice of speakers or earphones and/or output to other devices. As I said, the circuit is flexible and can be configured for dozens of applications. Think the project through and tailor it to suit your needs.

The Year of the Interface—Continues

In February I said 1992 was the Year of the Interface; in March I reviewed two possible candidates. Now there's another new interface just announced: the HB-232 Scanner/Computer Interface, developed by Commtronics. It is designed to turn your PRO-2004, PRO-2005 or PRO-2006 scanner into a total monitoring system. The following is an overview of the HB-232's most prominent features.

The HB-232 Scanner/Computer Interface connects between a PC/XT/AT/386/486/clone computer (512-k min) and a PRO-2004/5/6 scanner. A standard serial cable connects the HB-232 to the computer's COM port. The HB-232 can be installed inside the scanner, or better still, in a small project box, with a short cable and plug to mate with a receptacle mounted on the scanner. This latter method allows the HB-232 to be used with two or more scanners! The scanner is not appreciably modified either way: just some point-to-point wiring. Features and performance of the scanner aren't sacrificed, altered or lost by the addition of the HB-232.

Here are some of the HB-232's capabilities:

- Autoprograms into the scanner's memory channels up to 400 frequencies in less than nine minutes, along with desired custom settings of DELAY, MODE and LOCK-OUT.
- Views and controls all 29 standard scanner keyboard functions from the computer. The monitor displays a facsimile of the scanner's keyboard and its LCD display. Whatever appears in the scanner's display at any given time is simultaneously displayed on the monitor. Press M on the computer keyboard for MANUAL; press S for SCAN; press P for PRGM, etc.
- AutoLogs details of every "event" seen by the scanner to a text file. When the AutoLog mode is set and SQUELCH breaks, the computer writes & appends a line to a text file that shows channel number or SEARCH Bank; frequency; MODE setting (NFM, AM or WFM); DELAY status (On or Off); LOCKOUT status; SEARCH increment (if applicable); Date; Start Time; and

Duration of transmission. This text file is "comma-delimited" to make it exceptionally easy to load into almost any database manager for further processing & sorting as desired!

• When the scanner stops on an active frequency, an Anti-Birdie Function can compare that frequency to a file list of frequencies and instantly resume scanning or searching, if that frequency is on file. This feature is not limited to just "birdies"; any number of other undesired frequencies can go into the "birdie file," such as for pagers, computer data channels, continuous tones, encrypted signals, and other frequencies that you don't want the scanner to stop on or to AutoLog. There are even ways to automate the collection of undesired signals to add to the "birdie file."

The HB-232 also offers several ways to Search & Store, some without duplicating previously logged frequencies. A powerful, but easy to use, Script function provides the capability to customize and automate many otherwise laborious scanner operations. A special LookUp function displays a line of text to identify each scanner stop.

Four user-definable switches, controllable from the keyboard or through script, and five logic-status inputs are standard with the HB-232, to provide a variety of non-standard scanner operations and control. The user switches can control modifications and external circuits that may have been retrofitted to the scanner, such as extended memory blocks, automatic tape recorder switches, etc. The logic status inputs can trigger logical decision-making functions in the Script feature as well as test various processes or functions not otherwise visible or controllable by software.

A built-in text editor affords simple, easy editing of HB-232 data files. The HB-232 offers configurable menu positions for two user tools of choice, typically DOS utilities, to make interface life much easier.

The heart of the HB-232 is a microprocessor chip that's programmed by the computer when the HB-232 program is booted. This means there's no expensive, impossible-to-replicate firmware on the circuit board; just generic or readily available parts. The program and the microprocessor are the sole controllers of the HB-232; easily and economically upgradable by periodic revisions on disk. The "architecture" of the HB-232 may become open to bona-fide developers to encourage third-party support.

OK, so what's the catch? None really, unless maybe it's that the HB-232 comes as a kit of parts with a printed circuit board and a program disk at a cost of $169.95. Considering the detailed documentation and guided steps for the procedure, that's not much of a catch. See the sidebar for more info and source of the HB-232 Scanner/Computer Interface and other related companies.

MT

Sources

Integrated circuits & electronic parts
Easy Tech, Inc.
2917 Bayview Drive
Fremont, CA 94538
800-582-4044/FAX 800-582-1255

Digi-Key
Highway 32 South, P.O. Box 677
Thief River Falls, MN 56701
800-344-4539

Jameco Electronics
1355 Shoreway Road
Belmont, CA 94002
415-592-8097

Information/Source of HB-232 Interface
Commtronics Engineering
P.O. Box 262478
San Diego, CA 92196-2478
BBS & FAX Only: 6pm-1pm, PST
(619) 578-9247

Other Interfaces & Control Programs
Datametrics, Inc.
2575 South Bayshore Dr., Suite 8-A
Coconut Grove, FL 33133

RW Systems
P.O. Box 910043
Escondido, CA 92191

J&J Enterprises
4001 Parkway Drive
Bossier City, LA 71112
(318) 631-3081/FAX (318) 631-3082

W. Clem Small, KR6A, CET

What Makes a Good Antenna?

Lots of Signal, Little Noise and Computer Programs

What factors make for a good antenna? Well, the basic requirements for a good shortwave receiving antenna are not necessarily identical to those for a good shortwave transmitting antenna. For optimum effectiveness in transmitting we need an antenna with a gain level and a radiation pattern that will combine to produce an adequately-high field intensity at the receiving site. In other words, one which has enough signal strength to be detectable above any kind of noise present at the receiver.

On the other hand, we want the receiving antenna to respond to incoming energy in a way that will produce a large signal-to-noise ratio, which means that the antenna furnishes the receiver with lots of the desired signal and very little received noise. Again this will take a certain amount of gain and an appropriate radiation (reception) pattern.

Although the requirements just stated above are different for a transmitting antenna than for a receiving antenna, both kinds of antennas are designed to satisfy the same goal: to furnish the receiver with a sufficiently high level of the desired signal to allow satisfactory reception of that signal over any noise that is present when the signal is being detected.

Antenna Reciprocity

Antennas are said to have "reciprocity" because each antenna functions identically in terms of such things as gain and directivity, regardless of whether it is used for receiving or for transmitting. Because of this reciprocity we sometimes hear it said that an antenna which is an effective antenna for transmitting on a two-way radio circuit is certain to be an effective receiving antenna on that same circuit. Although this intuitively sounds correct, it is not always so in practical situations. Let's see why.

Notice that in fig. 1A there are two antennas (A1 and A2) and a noise source. The noise source could be any source of electrical noise such as electrical industrial machinery, a nearby thunderstorm, or even the signal from a station which you don't want to receive. The radiation or reception pattern of each antenna, and of the noise source, is shown with each pattern centered on its antenna or source.

A1 and A2 are identical antennas, connected to identical shortwave stations. Notice that when antenna A1 is transmitting to antenna A2 we have good communication because A2 is well within A1's radiation pattern (the circle with A1 at its center), and A2 is also outside the noise source's radiation pattern. In other words, it looks as if sufficient signal will get from A1 to A2 for good reception, and that A2 will not receive excessive noise interference from the noise source.

Now consider the reverse signal path when A2 transmits and A1 receives. A1 is well within the radiation pattern of A2 and so it would appear that sufficient signal would be furnished from A2 to A1. And, because antenna reciprocity is a well-established principle, we would expect just that. However notice that the radiation (reception) pattern of A1 also includes a good portion of the radiation pattern of the noise source. This means that there will be significant reception of the interfering noise from the noise source and, if the noise signal is strong, the signal from A2 will be partially or perhaps completely masked.

Thus, even though A2 puts in a good level of signal field-strength to A1, reception is impaired by the noise and communication will be difficult or impossible. In this situation, despite the fact that there is reciprocity between A1 and A2, A1 makes a satisfactory transmitting antenna but an unsatisfactory receiving antenna.

We can remedy the problem caused by the noise source through the use of a directional antenna such as shown in fig. 1B. If the antenna A1 were a beam antenna with a directional radiation and reception pattern such as is shown in fig. 1B, it would be relatively unresponsive to signals from the noise source. This is illustrated in fig. 1B where antenna B1 is receiving signals from antenna B2. B1's radiation pattern shows that it has very good responsiveness to signals from B2, and at the same time is relatively unresponsive to noise signals from the noise source. Thus the desired signal received from B2 will be relatively strong and will have little received noise with which to compete: reception will be good.

Coincidentally, this is a good place to point out that, if used for transmitting, antenna B1 will cause minimal interference to stations which are not in the direction of B2. Obviously then, whether you utilize an antenna for receiving or transmitting, you should consider whether its performance characteristics are appropriate to your specific application.

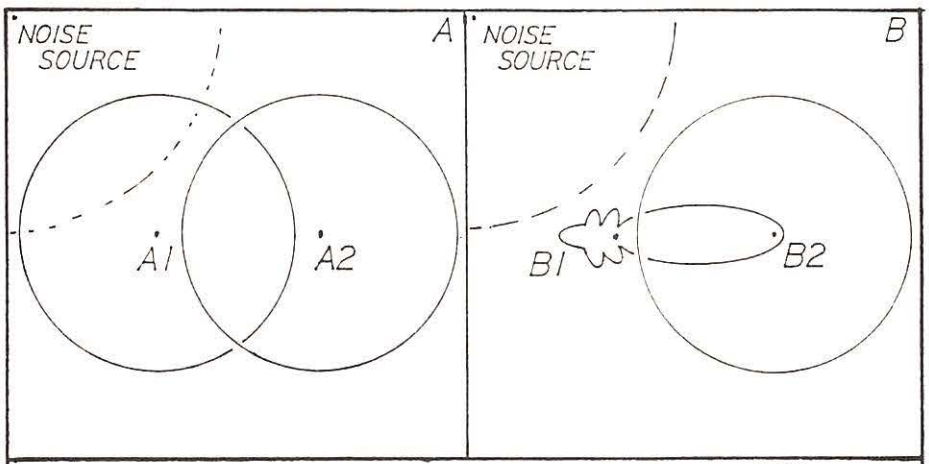


FIG. 1. RADIATION AND RECEPTION PATTERNS FOR FOUR ANTENNAS AND A NOISE SOURCE.

Designing or Evaluating Antennas on Your Own

It would be nice to be able to make a model of each antenna which interests you and then check out its performance. This would be a neat way to get the information you need in choosing an antenna for your particular application. Fortunately this approach is easier to do than you might think. There are a few antenna design-and-evaluation computer programs available which can help you do this.

To my knowledge, the only one which is full-featured, powerful and yet relatively easy to use is ELNEC. This program does require a bit of looking at the manual to get started (as any program will), but it is much less demanding and more user friendly in this respect than the other powerful programs of which I am aware.

ELNEC'S menu allows you to evaluate both horizontal and vertical radiation and reception patterns (azimuth and elevation patterns), gain, feedpoint impedance, beamwidth, sidelobe level and angle, and a number of other factors which can help you select the antenna you need for your application. You can even superimpose multiple radiation patterns for comparison on a single graph.

You choose the orientation, length, and diameter of the conductors which make the antenna which you want to evaluate. You can add loading coils or similar components, set the antenna height above ground, and match the ground to the conditions similar to your home earth-ground. There are other features such as evaluation of phased arrays, and much more.

You can evaluate the antenna which you are designing and then change it and re-evaluate it to see what effect those changes have on its operation. A number of common antenna types, already "built" and ready to evaluate, can be called up from the menu. Once you have designed an antenna design you want to keep, you can save it on a computer disk or print it with your computer's printer.

ELNEC requires an IBM PC-compatible computer with at least 512k of RAM and a CGA, EGA, VGA, Hercules, or comparable adapter. It is available from Roy Lewallen, W7EL, P.O. Box 6658, Beaverton, OR, 97007. The price listed in my recent brochure is $49.00, postpaid. Specify if you want the coprocessor "ELNEC", or the non-coprocessor "ELNEC-N", and what type of disk you use (360k or 1.2M 5.25", or 720k 3.5"). For more information you can write Roy Lewallen at the above address or call him at 503-646-2885.

Radio Riddles

Last Month

Last month I asked you: "Why do people talk about a center-fed halfwave dipole as having an impedance of 72-ohms, when in practice we find such an antenna to have anywhere from about 20 ohms to almost 100 ohms impedance?"

Well, antennas are described theoretically as if they are in free-space, far away from earth. In that condition this antenna does have 72-ohms center-feed impedance. But interaction with a real ground, as when you mount a dipole in your back yard, changes the antenna's impedance by an amount determined by the antenna's height above ground. Its impedance is often closer to 50-ohms than to 72-ohms. So, using 72-ohm feedline is often inappropriate for this "72-ohm" antenna! Fortunately the resulting mismatch has little practical effect on the antenna's use in most transmitting installations and essentially no effect on its use as a shortwave receiving antenna!

This Month

Noise, as it competes with a signal we want to hear, is an important consideration in radio reception. What are the sources of the various noises which give us trouble in reception? Hint: one of the sources is "out of this world!"

You'll find an answer to this month's riddle, and much more, in your next issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT

Q. *Where can I get printed reception forms like the sample in Gerry Dexter's first edition of* ***Shortwave Listening with the Experts?*** *(Ken Dowal, Austin, TX)*

A. A package of such forms, including QSL requests, program schedule forms, memory channel registers and more is available for $12 including shipping from the author at Tiare Publications, P.O. Box 493, Geneva, WI 53147.

Q. *Where can I get a 12 VDC (or other low voltage) timer that can be used to control a radio? (Frank Shoemaker, Erieville, NY 13061)*

A. While AC program timers are readily available from many consumer appliance stores and can be used with AC operated radios, DC timers are not in consumer demand—and are hard to find.

After about an hour of long-distance telephoning around the country, we found one company which will be manufacturing such a device for under $100 in the next few months. For information on a distributor in your area, contact Paragon Electric, 606 Parkway Boulevard, Two Rivers, WI 54241 or call them toll-free at 800-732-8400.

Q. *A recent MT article reported an FCC bust of "freebanders," illegal radio operators who interfere with licensed services in the 26-26.95 and 27.42-28 MHz bands. Who are these licensees? (Warren Freasier, Corpus Christi, TX)*

A. 26.10-26.175 Maritime; 26.175-26.48 Land Mobile; 26.48-26.96 Federal Government (26.62 Civil Air Patrol); 27.41-27.54 Industrial Land Mobile; 27.54-28 Federal Government and Commercial Forestry Products.

Q. *What is the frequency range being used by GTE's new "Tele-Go" wireless phone system now being test marketed in the Tampa Bay, Florida area? (Jim Connell, Sarasota, FL)*

A. Tele-Go is sharing cell site space—and 869-894 MHz cellular frequencies—with the cellular telephone industry. Their antennas are rigged separately on existing cellular towers and are intended as part of their Personal Communications Services, not as a competitor to cellular.

The personal radiophones may be thought of as a limited-range call-forwarding system while the consumer is at the store, out for a walk, whatever. Like other mobile and portable radiotelephones, the system is not scrambled.

The $25 million project ties together Sarasota, Manatee, Hillsborough, Pinellas and Pasco Counties and some 3000 prospective participants are expected to be on line, toll free, by the end of 1993.

Q. *Can anyone help me find the address of the company that made the "Hotshot Instant Access Dialer"? (R.H. McMinn, 10915 Bonavista Lane, Whittier, CA 90604)*

A. Readers?

Q. *I am confused by the conflicting monitoring laws. Can I listen to cellular phones, cordless phones, wireless baby monitors and air-to-ground telephones? (Scott Skurzewski, Cheektowaga, NY)*

A. No, yes, yes, no. The Electronic Communications Privacy Act of 1986 prohibits the monitoring of any radiotelephone conversation that utilizes a common carrier (AT&T, etc.).

A separate law, Section 605/705 of the 1934 Communications Act, prohibits the divulgence to another person or the use for personal gain any information overheard on a transmission not intended for you.

Bob's Tip of the Month

Full Earphone Volume for BC200XLT

As we pointed out some months ago, Uniden utilizes an audio limiting resistor in their earphone jack to prevent ear damage from blasting—plugging in an earphone while the speaker is operating at full volume.

One publicized fix is to connect a small wire between the BNC jack (chassis ground) and the earphone jack, effectively bypassing that resistor and restoring full earphone volume.

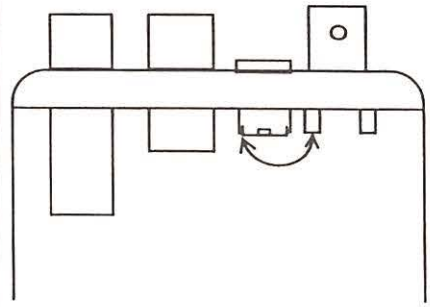
John LaMotte of Little Rock, Arkansas, found a better way—if you don't mind taking the back off the scanner and doing a little soldering. Keep in mind that any alterations may void your warranty. *MT* assumes no responsibility for damages resulting from attempting this procedure.

This modification is intended for driving external speakers and other auxiliary devices. If using the scanner with an earphone or headset, keep the volume control low to avoid permanent hearing loss!

After sliding off the battery pack and removing the screws holding the spring contact and cover in place, carefully separate the back of the radio and note the earphone jack.

At the left-hand side of the jack is a slot with metal showing through the jack. Solder a small wire from that metal to the ground lug between the jack and the BNC connector.

This completes the modification. Reassemble the case and test the audio with the earphone lying on a table, not plugged into your ear!



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PS Form 3526, Dec. 1981 (See instructions on reverse)

DX Radio Tests

The International Radio Club of America (IRCA), is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. *DX Monitor*, the official publication of IRCA, is published 34 times a year and contains members' loggings, articles on radio stations, receiver reviews, technical articles, DX tips and other material of interest to the broadcast band DXer. For more information, or a sample issue of *DX Monitor*, write to: The International Radio Club of America (IRCA), 11300 Magnolia #43, Riverside, CA 92505, USA. Please enclose 1 U.S. dollar or 3 IRCs if you are requesting a sample issue.

These tests were arranged by J.D. Stephens for IRCA.

Tuesday, October 6, 1992: WCKB-780, Box 789, Dunn, NC 28335, will conduct a DX test from 5:30-6:00 am EDT. The test will include tones, voice ID's and Morse code ID's. Reception reports may be sent to: Mr. Ron Tart, General Manager.

Monday, October, 12, 1992: KXOL-1320, 1730 Neptune Drive, Clinton, OK 73601, will conduct a DX test from 3:00-3:30 am EDT. The test will include March music, voice ID's and Morse code ID's. Reception reports may be sent to: Mr. Dennis Burton.

Monday, October 26, 1992: WLYN-1360, Lynn, MA, will conduct a DX test from 3:30-4:00 am EDT. The test will include Morse code, tones and voice ID's. Our thanks to Mr. Michael Klein (NV1L) of DX Enterprises for the test. Mr. Klein requests that all reception reports be sent to: WLYN DX Test, c/o Personal Database Applications, 2626 Meadow Ridge Drive, Duluth, GA 30136-6037.

Club Circuit

Club Profiles

Canadian International DX Club

This year CIDX is celebrating its 30th anniversary. The club's 300+ members are very active in promotion of the radio hobby. CIDX addresses all types of listening, although the main focus is on shortwave. Each year the various chapters across the country participate in numerous hamfests and fleamarkets.

In Montreal the club exhibits annually at the Montreal Hobby Show and also organizes the annual Montreal International Radio Festival. Two Montreal club members co-host and produce a weekly radio broadcast on CKUT-FM Radio McGill, 90.3 MHz. The half-hour weekly programme is called the International Radio Report and has been on the air for four years. It is aired Sunday mornings at 10:30 Eastern.

The largest membership bases for CIDX are in the cities of Montreal, Edmonton, Vancouver, Winnipeg and Calgary. The Montreal chapter meets the second Tuesday of every month at the Centre St. Pierre, 1215 de Visitation St., Montreal.

The club is a member of ANARC. Unlike most other clubs, the monthly bulletin of the club—the *Messenger*—has no restrictions as to number of pages per column or per bulletin.

Although a Canadian club, membership is open to radio enthusiasts the world over. Membership is $26 in Canada, $25US in US, $35 Canadian elsewhere. Sample bulletins can be obtained for $2.00 from CIDX, 79 Kipps Street, Greenfield Park, Quebec, Canada J4V 3B1.

Radio Monitors of Maryland

This fast-growing club already boasts nearly 300 members, even though the first publication of its bulletin, *Radio Monitors Newsletter of Maryland* was as recent as December 1989. The club addresses anything in the realm of HF/UHF/VHF utilities—public safety, aeronautical, maritime, military, amateur, and wefax!

The group's activities include meetings at editor Ron Bruckman's home and other outings at least three times a year. The largest activity is in reader input to the newsletter, which the editor says "is plain and simple—it's Homebrew!"

Membership of $15 includes the monthly newsletter, tours, and outings—including the food! Send an SASE to Ron Bruckman, P.O. Box 394, Hampstead, Maryland 21074 for more information.

Club Listings M - Z

Don't see your club listed this month or in last month's A-L listing? Write or call the Brasstown office to request a form for the Club Circuit.

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 311, Wixom, MI 48393. Michigan & surrounding; All bands. *Great Lakes Monitor.*

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513)777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal.*

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).*

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 299-6392 DX-Change information svce. Predominantly Providence of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario.*

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura , 39350Pakistan; Pakistan; SWBC.

Pitt Cty SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners.*

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.*

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal.*

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colorado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post.*

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna Cty Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Let's Start a Club:

David Williams, P.O. Box 174, Fort Payne, AL 35967. Interested in scanner and shorwave monitoring.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Oct 1	**Houston, TX**	SPECIAL OPERATION: KK5W 1500Z-2100Z to commemorate the 9th Annual Childrens Christmas Card Parade. Operation on 7292.9, 18129.9, 21392.9 and 28392.9. QSL and SASE to KK5W, MD Anderson Hospital, Amateur Radio Volunteers, 1515 Holcombe Blvd., Houston, TX 77030-4095.
Oct 2-4	**Atlanta, GA**	1992 Monitoring Times Convention Location: Omni Hotel at CNN Center. $40 registration, $21.95 banquet. Walk-in for exhibits only for $5. See ad on page 5 for more details.
Oct 3-4	**Boxboro, MA**	New England ARRL Convention/(617) 631-7388.
Oct 10	**Columbus, IL**	SPECIAL OPERATION: W9AWE, Western Illinois ARC celebrating Quincentennary of the European Discovery of America. 1400Z Oct 10 to 2400Z Oct 11 on general SSB and CW sub-bands, packet and 147.03 W9AWE repeater. QSL and sase to: WIARC, PO Box 3132, Quincy, IL 62305.
Oct 10	**Baldwinsville, NY**	RAGS Hamfest/(315)469-0590 Location: Tri-County Convention Center, 9 am-4 pm. Talk-in on 146.31/91 MHz.
Oct 11	**Waukesha, WI**	KMRA Swapfest/PO Box 411, Waukesha, WI 53187-0411. Location: Waukesha Co Exposition Center, Hwys J and FT.
Oct 17	**Scotch Plains, NJ**	TCRA Hamputer Fest/P.O. Box 412, Scotch Plains, NJ 07076 Location: Union Catholic Regional HS, 1600 Martine Avenue $4 admission, 8 am to 2 pm, talk-in on 147.255 449.975 simplex 146.52.
Oct 17-18	**Concord, CA**	Pacific Div ARRL Convention/Lauren Styles, WA6CIE 1910 Sunshine Dr., Concord, CA 94520.
Oct 18	**Golden, CO**	RMRL Hamfest/David L. Avery, N0HEQ 6616 S. Lafayette St., Littleton, CO 80121-2545 Location: Jefferson Co Fairgrounds, West 6th and Indiana Avenues. $2 admission, talk-in on 145.220.
Oct 18	**Sanford, NC**	CCARS Swapfest/George Batchelor, KD4FPZ, (919) 776-7584 Location: Lee Cty Fairgrounds, 7th Street. $5 admission, 9 am to 4 pm, talk-in on 147.105, 147.180.
Oct 18	**Queens, NY**	Hall of Science ARC Hamfest/Charles Becker, WA2JUJ, (516)694-3955 or Arnie Schiffman, WB2YXB, (718)343-0172. Location: NY Hall of Science parking lot, 47-01 111th Street. Opens at 9 am, admission by donation. Talk-in on 445.175 NB2A repeat 146.52 simplex.
Oct 31-Nov 1	**Odessa, TX**	1992 Odessa Hamfest/West Texas ARC, P.O. Box 7033 P.O. Box 7033, Odessa, TX 79760 Location: Holiday Inn Convention Center, 6201 E. Highway 80 $7 admission, 8 am to 5 pm Sat; 8 am - 2 pm Sun.
Oct 31-Nov 1	**Lawrenceville, GA**	Computer Expo Hamfest '92/Alford Memorial Radio Club Hamfest P.O. Box 3100, Lithonia, GA 30058 Location: Gwinnett Cty Fairgrounds.
Nov 14	**West Monroe, LA**	Twin City Hams/Jimmy Ramsey, N5DMX 103 W. Fairway Drive, West Monroe, LA 71291
Nov 21-22	**Tampa, FL**	Florida State Convention/Pat Barbiere, WB1GZW 2225 Glen Dr., Safety Harbor, FL 34695.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Event Calendar
P.O. Box 98
Brasstown, NC 28902-0098

INDEX OF ADVERTISERS

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*. **Ad copy must be typed for legibility.**

Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word - *Subscribers only.* All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

SURVEILLANCE, COUNTER SURVEILLANCE EQUIPMENT FOR SALE. WRITE SHERWOOD COMMUNICATIONS, BOX 535-G, SOUTHAMPTON, PA 18966 (215) 357-9065.

ICOM R-9000 with CRSI6000 $3750, 404-256-3618.

NEW ICOMS: H10 $425; U10 $440; H16 $515; U16 $525; A21 $495; M7 $279; 100 feet 9913 with solder PL-259s $99; MC/VISA/AMEX; XPM Inc. Communications (512) 693-4999.

RADIO-SCANNER MODIFICATIONS Over 180 different models; $12 for three IBM 5.25" disks. J. Worthington, Box 1953, Eugene, OR 97401.

ACE/AOR AR2500. 1-1500 MHz. Mint. $300. (514) 739-9328.

SHORTWAVE PARADISE BBS now has the new Fall schedules available. Call our computer line now at 1-305-524-1035. We are a FREE BBS computer system!

ICOM ICR7000 RECEIVER with remote. Like new less than 6 months old $825. Will ship. Call Phillips (704) 982-6660.

AR1000 - 1000 channel handheld scanner covers 8-600, 805-1300 MHz complete, exc condition. Includes book by Harold Bornstein "Guide to the AR1000" $325. BEARCAT 300 complete, exc condition, $100. Rudy 708-358-1150.

BC200XLT 6 mos old. Cellular mod. Metrowest Pro Pack 1200 Ma Hr. battery, Pro Charge 7 charger: $200. 414-279-3342.

KENWOOD R5000 with filter upgrades, mint condition, less than 50 hours use. Call 802-684-2520 after 8 pm.

KENWOOD R2000 receiver like new in box $445, W6XM, 619-459-5527.

WANTED: GRE SUPER CONVERTER "2" which receives 810-912 MHz on handheld scanners 602-584-7144.

LONG ISLAND SCANNER/SWL NET Tune in 147.210 every Thursday, 8:30 pm.

DRAKE R-8, mint, new 12/91, original box, manual, matching outboard speaker, $700, 510-754-8859 after 6 pm PST.

C64 and C128 programming and technical books and software. SASE for list. Lash, 2679 Glenwood-Dyer Road, Lynwood, IL 60411.

FOR SALE: HAMMERLUND HQ-100A RECEIVER, $125 plus shipping. Mint! Jim B. Cooper Sr., PO Box 792, Brandon, MS 39043, 601-825-8108.

SELL UNIVERSAL M7000 updated 6.03. Date and time clock and manual, $725. 503-775-9621.

ICOM R-1 w/extended battery pack, case and extension speaker, $395; SONY AIR-8, $175. All mint condition. ARA VHF/UHF power antenna, $125. Send SASE for complete list. Darrel Charest, 3420 Trenary Lane, Colorado Springs, CO 80918, 719-528-1322.

10 Meter mobile amplifier, 100 W AM/FM, 200W SSB output. Brand new, $125. Write: G. Cochran, PO Box 13283, Roanoke, VA 24032.

THE SECRETS OUT! Arthur Cushen's Radio Listener's Guide reveals the secrets of Enemy Broadcasts 1941-1945 now released by NZ Security Intelligence Service. Part of second edition Radio Listeners Guide covering all aspects of medium and shortwave listening, 116 pages, 11-1/4" x 8", illustrated with over 100 photographs of personalities, verifications and archives material. Available from Gilfer Shortwave, Box 239, Park Ridge, NJ 07656, $17.95US. Additional information from Arthur Cushen Publications, 212 Earn St., Invercargill, New Zealand.

Closing Comments

Dear Fellow "Technocreeps,"

In an eleventh-hour bid to further misinform our legislators and heighten paranoia over cellular eavesdropping, cellular propagandist Norman Black recently tossed down the gauntlet, using the resources of the Associated Press to brand scanner owners "a bunch of technocreeps who are violating our privacy in the name of a hobby."

Seasoned legislators see Black's schoolyard name calling for what it is: a carefully choreographed effort to prop up sagging interest in the Cellular Telecommunications Industry Association's proposed anti-scanner amendment to the FCC Funding Bill.

Cellular providers have historically refused to provide privacy for their customers' conversations as stipulated by the FCC; worse, they have consistently avoided their moral responsibility to truthfully advise their customers that cellular telephone conversations may be easily overheard.

Rather than spend five dollars per phone to guarantee privacy to their trusting customers, the cellular magnates choose to malign scanner owners as "technocreeps," "hackers" and "high tech snoops" in an effort to prejudice our legislators to enact an unnecessary and restrictive law, equally as ineffectual, self-serving and embarrassing as their Electronic Communications Privacy Act of 1986.

The proposed anti-cellular-frequency amendment, which would prevent sale to the public scanners with cellular frequencies—or even cellular-restorable capability—would have virtually no effect on uninvited interception of cellular phone calls.

Cellular conversations would still be heard on image frequencies, on receivers with external converters, on test equipment and tunable receivers, even with UHF-TV sets. But the CTIA-sponsored law would provide the one marketing tool that cellular has wanted since the unfortunate passage of the ECPA: the illusion of privacy.

They would be able to continue to tell their customers—this time truthfully—that scanners no longer have cellular frequency coverage. In the industry's profit-motivated mindset this would absolve them of any responsibility to provide real privacy for their customers.

Let's hope that our legislators see through this crassly commercial ploy, this financial expedient of the CTIA, and pass the FCC Funding Bill without the cellular amendment.

Bob Grove
Publisher

A Scanner Listener Responds

In referring to radio hobbyists who listen to cellular phone conversations as "techno-creeps," Norman Black, spokesman for the Cellular Telecommunications Industry Association, not only misses the point, but does a disservice to those who buy and use the products produced by CTIA members.

The plain truth is that anyone who uses radio-assisted telecommunications—cellular, cordless, or ship-to-shore telephones—is broadcasting his conversation for all the world to hear. These transmissions travel considerable distances, penetrating, uninvited, the dwellings and businesses of others.

To hear these signals, no bugs must be planted; no one must "stand under the eaves" in order to hear a private conversation; one must merely listen to the radio. These communications are as fully in the public air space as the signals from any radio or television station.

The CTIA would like to preserve the fiction of "a reasonable expectation of privacy" because that suits its commercial purpose. Radio-assisted phone users continue to believe this lie because the instrument they use looks and feels like an ordinary telephone receiver.

But how would they react if they realized, truthfully, that they are using a microphone connected to a radio transmitter? I suspect the myth of privacy would vanish in a puff of marketing babble.

JRC NRD-535D

"Best Communications Receiver"
World Radio TV Handbook 1992

"Unsurpassed DX Performance"
Passport to World Band Radio 1992

Setting the industry standard once again for shortwave receivers, the NRD-535D is the most advanced HF communications receiver ever designed for the serious DXer and shortwave listener. Its unparalleled performance in all modes makes it the ultimate receiver for diversified monitoring applications.

Designed for DXers by DXers! The NRD-535D (shown above with optional NVA-319 speaker) strikes the perfect balance between form and function with its professional-grade design and critically acclaimed ergonomics. The NRD-535D is the recipient of the prestigious World Radio TV Handbook Industry Award for "Best Communications Receiver."

- Phase-lock ECSS system for selectable-sideband AM reception.
- Maximum IF bandwidth flexibility! The Variable Bandwidth Control (BWC) adjusts the wide and intermediate IF filter bandwidths from 5.5 to 2.0 kHz and 2.0 to 0.5 kHz—continuously.
- Stock fixed-width IF filters include a 5.5 kHz (wide), a 2.0 kHz (intermediate), and a 1.0 kHz (narrow). Optional JRC filters include 2.4 kHz, 300 Hz, and 500 Hz crystal type.
- All mode 100 kHz – 30 MHz coverage. Tuning accuracy to 1 Hz, using JRC's advanced Direct Digital Synthesis (DDS) PLL system and a high-precision magnetic rotary encoder. The tuning is so smooth you will swear it's analog! An optional high-stability crystal oscillator kit is also available for ±0.5 ppm stability.
- A superior front-end variable double tuning circuit is continuously controlled by the CPU to vary with the receive frequency automatically. The result: Outstanding 106 dB Dynamic Range and +20 dBm Third-Order Intercept Point.
- Memory capacity of 200 channels, each storing frequency, mode, filter, AGC and ATT settings. Scan and sweep functions built in. All memory channels are tunable, making "MEM to VFO" switching unnecessary.
- A state-of-the-art RS-232C computer interface is built into every NRD-535D receiver.
- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.

JRC *Japan Radio Co., Ltd.*

Japan Radio Company, Ltd., New York Branch Office – 430 Park Avenue (2nd Floor), New York, NY 10022, USA Tel: (212) 355-1180 / Fax: (212) 319-5227

Japan Radio Company, Ltd. – Akasaka Twin Tower (Main), 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, JAPAN Tel: (03) 3584-8836 / Fax: (03) 3584-8878

TAKE THE WORLD ON THE ROAD

WORLDWIDE RECEIVERS FROM ICOM

IC-R100 MOBILE RECEIVER

Whether you're at home or in your car, the IC-R100 gives you continuous coverage from 100kHz-1856MHz in AM, FM and wide-band FM modes. Monitor VHF air and marine bands, emergency services, government and amateur stations. 121 fully programmable memory channels, multiple scanning systems and a built-in backup lithium battery.

IC-R1 HANDHELD RECEIVER

The smallest wideband handheld available today, the IC-R1 continuously covers 100kHz-1300MHz with AM, FM and wide-band FM modes. This tiny receiver goes anywhere you go, measuring just 1.9"W x 4.0"H x 1.4"D.

Easy operation is a snap with the IC-R1's Dual Frequency Selection (direct keyboard and rotary tuning), 100 memories and a 24-hour clock complete the world's smallest full-featured handheld receiver.

IC-R72 BASE RECEIVER

The IC-R72 continuously receives 100kHz-30MHz in SSB, AM and CW modes with exceptionally high sensitivity. An optional UT-8 provides FM reception. The IC-R72 incorporates a noise blanker, five scanning systems, internal backup battery and built-in clock with Icom's DDS System. The IC-R72 boasts a 100dB wide dynamic range while an easy to access keyboard provides convenient programming versatility... superb for shortwave listeners!

See our complete line of quality receivers at your local authorized Icom dealer.

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Bellevue, WA 98004
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